

TE 2000 $^{\text{T}}$ VT/ANSI Terminal Emulation PROGRAMMER'S GUIDE

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Before You Begin

About This Manual

This manual contains information necessary to configure and operate TE 2000[™] terminal emulation applications (version 6.30 or greater) for INTERMEC® terminals. This manual is intended for these audiences:

- ▶ All users who need to know how to use terminal emulation.
- ▶ Information systems personnel, operations personnel, analysts, and programmers who need to know how to configure, test, and use the terminal emulation application to operate in a network. You should have a good knowledge of your company's network and data collection software. You should be familiar with data communications and network protocols.

Organization of This Manual

The following chart summarizes the information in each section.

То	See Section
Get started with VT/ANSI terminal emulation	1
Use VT/ANSI terminal emulation applications	2
Use your terminal's keyboard	3
Use the terminal emulation configuration menus for your Trakker Antares® terminal*	4
Customize your configuration	5
Program with VT/ANSI received codes and transmitted codes	6
Use extended commands	7

For information about the terminal emulation menus for the 6400 or 5055 computer, refer to the computer's user manual. For a list of manuals, see "Related Manuals' later in this section.

In addition, Appendix A contains bar codes for VT/ANSI terminal emulation commands. Appendix B is a full ASCII table.

Terminology

Term	Description
248X	Indicates the Trakker Antares 2480, 2481, 2485, and 2486 terminals.
Host	Refers to a personal computer or other computer that communicates with the terminal.
TE	Stands for terminal emulation.
Terminal	Generic term that indicates any terminal that supports terminal emulation.
VT/ANSI	Indicates VT100/220/320/340 and ANSI.

Conventions for Input From a Keyboard

To help you quickly locate and interpret information, this manual uses the conventions in the following chart.

Convention	Meaning
Monospace text	Shows the command as you should enter it.
Italic text	Indicates a variable you must replace with a real value, such as a number, filename, or command.
•	Shows the key you must press on the terminal's keyboard. For example, "press —" directs you to press the Enter key.
(f) (F1)	Shows a series of keys you must press and release in the order shown. For example, "Press (f) (r) to open the TE configuration menus on the 2425."

Bar Code Conventions

You can scan the bar codes listed in this manual to enter data or perform a command. The bar codes are in the Code 39 symbology. Each bar code includes the name and human-readable interpretation. For example:



The asterisks (*) at the beginning and end of the human-readable interpretation are the start and stop codes for a Code 39 bar code label. If you are using a bar code printing utility, it may automatically supply the asterisks as the start and stop codes, so that you only need to type the actual text of the command. You can also create and print configuration labels and reader command labels in Code 93, which has its own start and stop codes.

Related Manuals

To order a printed manual, contact your Sales Representative. Several online manuals are also available in Portable Document Format (PDF) on the Intermec web site. The list of online manuals is at:

http://corp.intermec.com/manuals/english.htm

Or, choose "Products" then "Manuals" and "English" from the opening page.

You must download the free Adobe Acrobat Reader to view the PDF manuals. Instructions are at:

http://corp.intermec.com/manuals/manuals.htm # reader

Following are related INTERMEC manuals and part numbers (P/N).

Manual	P/N
2100 Universal Access Point User's Manual	067150
5055 Data Collection PC User's Guide	961-054-017
The Bar Code Book	051241
DCS 300 System Manual	067296
DCS 300 Technical Reference Manual	067717
EZBuilder Getting Started Guide	066450
EZBuilder Tutorial	066449
PEN*KEY Model 6400 User's Guide	961-047-093
TE 2000 3270 Terminal Emulation Programmer's Guide	977-055-003
TE 2000 5250 Terminal Emulation Programmer's Guide	977-055-004
TRAKKER Antares 241X Hand-Held Terminal User's Manual	069538
TRAKKER Antares 2420 and 2425 Hand-Held Terminal User's Manual	064024
TRAKKER Antares 242X Serial Interface Module Instruction Sheet	067690
TRAKKER Antares 2455 Vehicle-Mount Terminal User's Manual	067358
TRAKKER Antares 248X Stationary Terminal User's Manual	066960
TRAKKER Antares 248X COM4 Adapter Cable Installation Instruction Sheet	068251
TRAKKER Antares Application Development Tools System Manual	064433
TRAKKER Antares Optical Link Adapter Quick Reference Guide	065826
TRAKKER Antares TD2400 Communications Dock Quick Reference Guide	065555
TRAKKER Antares TD2410 Communications Dock Quick Reference Guide	069552

Customer Support

Customer Support's on-going objective is to provide quality support to all of our customers worldwide.

Factory Service

If your unit is faulty, you can ship it to the nearest authorized Service Center for factory-quality service. The addresses and telephone numbers are included in the Warranty Card shipped with your product.

Customer Response Center

The Customer Response Center (technical support) telephone number is 800-755-5505 (U.S.A. or Canada) or 425-356-1799. The facsimile number is 425-356-1688. Email is *support@intermec.com*.

If you email or fax a problem or question include the following information in your message: your name, your company name and address, phone number and email to respond to, and problem description or question (the more specific, the better). If the equipment was purchased through a Premier Solution Partner, please include that information.

Web Site

The Customer Support File Libraries, including Hot Tips and Product Awareness Bulletins, are available via the Intermec Product Support page at this URL: http://norbbs.norand.com/index.htm. New users can sign up for a new account on this page.

PDF versions of Intermec manuals can be found at this URL: http://corp.intermec.com/manuals/english.htm.

Bulletin Board Service

The Customer Support Bulletin Board (BBS) provides software and documentation.

- ▶ **Phone number:** 319-369-3515 (14.4 Kbps modem) 319-369-3516 (28.8 Kbps modem)
- ▶ **Protocol:** Full duplex, ANSI or ANSI-BBS; 300 to 28,800 bps; v.32bis; 8 bits, no parity, 1 stop bit. For high-speed modems, disable XON/XOFF and $enable\ RTS/CTS.$

This is the same location available via the web site. If your web access uses high-speed phone lines, the web interface provides a faster response.

Section 1

Getting Started

Understanding Network Protocol Options

TE 2000™ applications for the Enterprise Wireless LAN™ system use one of the following network protocol options:

- ▶ UDP Plus the terminal communicates with the host computer through the INTERMEC® data collection server and access point.
- TCP/IP the terminal communicates through an INTERMEC access point, which is directly connected to the host computer on an Ethernet or a token ring network.
- ▶ WTP the terminal communicates with the host computer through the data collection server or other INTERMEC gateway.

For network configuration options, refer to your terminal's user manual.

Setting Up the Terminal and the Network

Before you can start using the TE 2000 application on your terminal, you need to do the following:

1. Set up your terminal.

Set-up includes charging and installing the battery pack and turning on the terminal for the first time. For instructions, refer to your terminal's user manual.

2. Configure your terminal and the network.

To use RF communications on the terminal, you need to:

- a. Configure the data collection server (UDP Plus or WTP), other INTERMEC gateway (WTP), or host (TCP/IP).
- b. Configure the access point.
- c. Configure the network parameters on the terminal.

For instructions, refer to your terminal's user manual.

3. Verify that your terminal is communicating correctly with the access point and data collection server or the host.

To verify that your terminal is communicating correctly, refer to the terminal's user manual for instructions.

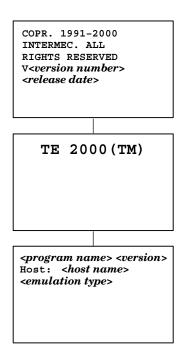
Getting Started SECTION 1

Starting the TE 2000 Application

You are ready to start your application once the terminal has been set up, the terminal and the network have been configured, and communications have been established with the gateway and access point or host.

To start your application:

Turn on the terminal. Wait a few seconds while the initialization screens (below) clear and the application starts.



► NOTE:

If your application does not start after a few seconds, you may not have configured the terminal correctly. For help, refer to your terminal's user manual.

You can now do one of the following:

- ▶ Become familiar with VT/ANSI TE if you have not previously used it
- ▶ Perform a quick configuration
- ► Configure your TE 2000 application
- ► Customize your TE 2000 application

Becoming Familiar With VT/ANSI Terminal Emulation

If you have not previously used VT/ANSI TE, see Section 2, "Using Terminal Emulation Applications," to understand VT/ANSI commands. See Section 3, "Using the Terminal's Keyboard," to become familiar with your terminal's keyboard and the keys you need to press to perform VT/ANSI commands.

SECTION 1 Getting Started

Performing a Quick Configuration

1. Change the data stream to VT/ANSI. The default data stream is 3270 for Trakker Antares[®] terminals and for 6400 and 5055 computers running IP. The default data stream is Native for 6400 and 5055 computers running WTP.

a. Access the terminal emulation configuration menus by pressing the keys in the following chart.

2415: \bigcirc (55-key keyboard)

(f) (5) (37-key keyboard)

6400: [GOLD] [BLUE]

5055: [GOLD] [M] (keyboard with color-coded keys) [ALT] [M] (keyboard with black keys)

b. From the Main Menu, choose 1) Set-up Parms.

NOTE:

To select a menu option, press the number of the option. To return to a previous menu, press Enter.

- c. At the **Enter Password** prompt, enter **cr52401**.
- d. From the Set-up Parms menu, choose 3) **Protocol Opts**.
- e. From the Protocol Opts menu, choose 2) Data Stream.
- f. From the Data Stream menu, choose 4) VT/ANSI.
- 2. Extended commands govern abilities unique to terminals. Enable the Extended Commands option if your host computer is configured to send extended commands to the terminal. It is disabled by default.
 - a. From the Protocol Opts menu, choose 3) Extended Cmds.
 - b. From the Extended Cmds menu, choose1) Enabled.
- 3. Save your changes.
 - a. From the Main Menu, choose 6) Exit Menus.
 - b. At the **Enter 'Y' to Save Parms** prompt, press **Y**.
 - c. At the **Enter Password** prompt, enter **cr52401**.
- 4. Login to a TE session.
- 5. Start using the terminal to collect and transmit data.

Getting Started SECTION 1

Configuring the TE 2000 Application

You can use the terminal's TE configuration menus to configure site-specific operational parameters, including:

- ▶ UDP Plus, WTP, or TCP/IP communications
- ▶ Terminal emulation options
- ▶ Main Menu password

For information about configuring the 2415, 2425, 2455, or 248X terminal, see Section 4, "Using the Trakker Antares' Terminal Emulation Menus." For information about configuring the 6400 or 5055 computer, refer to the computer's user manual.

Using Advanced Features

You can customize the standard TE 2000 program to:

- ▶ Use the auto-login feature to send the same login information each time you login to the host.
- ▶ Display double-byte characters.
- ▶ Create a custom parameter set-up file.
- ▶ Change the text of TE configuration menus or system messages.
- ▶ Remap the terminal's keys.
- ▶ Preinitialize the VT/ANSI TE program.

For more information, see Section 5, "Customizing Your Configuration."

Program Names

This manual covers TE 2000 version 6.32 or greater. The following chart lists TE options and program names.

Model	Option	Program Name
2415, 2425, 2455, 248X	TE/UDP Plus/2.4 GHz OpenAir TE/UDP Plus/802.11 TE/IP/2.4 GHz OpenAir TE/IP/802.11	FWP240H0
6400	TE/WTP/2.4 GHz OpenAir TE/WTP/802.11 TE/WTP/900 MHz Falcon TE/IP/2.4 GHz OpenAir TE/IP/802.11	FWP640H0/H4* FWP640H0/H4 FWP640H0/H4 FWP64TH0/H4 FWP64TH0/H4
5055	TE/WTP/2.4 GHz OpenAir TE/WTP/802.11 TE/WTP/900 MHz Falcon TE/IP/2.4 GHz OpenAir TE/IP/802.11	FWP650H0 FWP650H0 FWP650H0 FWP65TH0 FWP65TH0

^{*} FWP640H0 is the 51-key keyboard. FWP640H4 is the 41-key keyboard.

SECTION 1 Getting Started

Unsupported Commands and Functions for Trakker Antares Terminals

TE 2000 terminal emulation for the 2415, 2425, 2455, and 248X does not support the commands and functions in the following chart.

Command or Function	Description
End (viewport)	Moves the window/viewport to the end of the last line displayed on the TE screen.
Fast Cursor Right or Left	Moves the cursor two positions to the right or left rather than one.
Home (viewport)	Moves the window/viewport to the top left corner of the TE screen.
Reshow	Resends a screen image from the locally maintained host buffer to refresh the terminal screen.
Status	Toggles the terminal's screen between the status line display and the normal field input display.
Status line messages	Reports the operating status of the terminal and host system.
#H extended command	Sets TE configuration parameters that you would otherwise set at the terminal.

If you scan the bar code for an unsupported command, the bar code data is read into the terminal. If you press the key sequence for the command, the sequence is ignored.

Also note that Trakker Antares terminals with UDP Plus allow only one session per terminal.

VT/ANSI Standard Terminal Keyboard

To compare your terminal's keyboard with the VT/ANSI keyboard, see Figure 1-1, which is an illustration of the VT/ANSI terminal's standard North American keyboard. As you read how your terminal's keyboard emulates VT/ANSI operation, you may want to frequently refer to Figure 1-1 and the figure for your terminal.

Getting Started SECTION 1

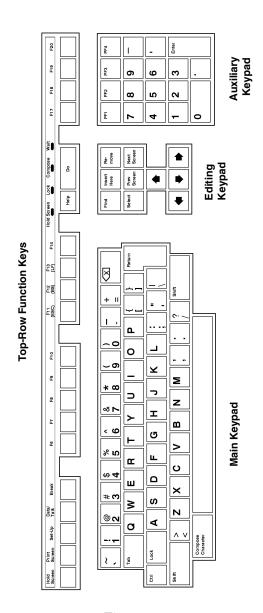


Figure 1-1 VT/ANSI Terminal Standard Keyboard (North American)

Section 2

Using Terminal Emulation Applications

Annunciators

The terminal's display reserves a location for annunciators (icons) that help you monitor RF and network communications, or alert you of a condition that requires action. Following are VT/ANSI TE annunciators.

- Keyboard action mode (KAM) has been set. The terminal ignores all X keystrokes that send characters to the host. This state stays on until KAM has been reset.
- K The terminal is in Keypad mode.
- \mathbf{C} The terminal is in Character mode. The terminal sends each character as it is pressed.
- The terminal is in Line Edit (block) mode. When you press a \mathbf{B} terminating key, the terminal sends a block of characters to the host.
- The terminal is in Local Edit mode, which is a feature of the \mathbf{e} VT330/VT340 terminal.

For information about annunciators that indicate battery condition and general operational status, refer to the terminal's user manual.

Main Keypad

The VT/ANSI terminal's main keypad consists of standard keys and function keys. Standard keys generate letters, numbers, and symbols. Function keys generate special function codes. The following chart describes the keys.

Function Key	Description	
Compose character	The terminal does not support this function, which starts a compose sequence that creates characters that cannot be typed directly from the keyboard.	
Ctrl	The Ctrl key alone does not send a code. It is used in combination with another key to send a control code.	
Delete	Operation depends on how the DEL to BS option is set in the TE configuration menus. The key either sends a delete (DEL, 7F hexadecimal) or a backspace (BS, 08 hexadecimal).	
Lock	The Lock key alone does not send a code. It is used in combination with shift lock, which either sets or clears shift lock.	
Return	Sends either a CR character (0D hexadecimal) or a CR character (0D hexadecimal) and an LF character (0A hexadecimal), depending on the set/reset state of line feed/new line mode (LNM).	
Shift	The Shift key alone does not send a code. It is used in combination with other standard keys to send uppercase characters.	
Space bar	Sends an SP character (20 hexadecimal).	
Tab	Sends an HT character (09 hexadecimal).	

To enter a function key:

Press the key(s) listed in the section for the terminal. Or, scan the bar code in Appendix A.

Editing Keypad

The terminal's editing keypad has editing keys and cursor (arrow) keys.

Editing Keys

► NOTE:

Editing keys apply only to VT220/320/340.

Editing keys have functions assigned to them by the application software in use. Refer to your application's software manual for information about editing key functions. Editing keys are:

- ▶ Find
- ▶ Insert here
- ▶ Next screen
- ▶ Previous screen
- Remove
- ▶ Select

To enter an editing key:

Press the key(s) listed in the section for the terminal. Or, scan the bar code in Appendix A.

Cursor Keys

You can manually move the terminal's window/viewport by using the cursor keys and paging keys. For more information about the window/viewport, refer to the terminal's user manual.

Auxiliary Keys

The VT/ANSI terminal's auxiliary keypad consists of numeric keys (which enter numeric data) and programmable function (PF) keys. The following chart describes VT/ANSI terminal auxiliary keypad operations.

Auxiliary Keys	Description
0-9	Enter numeric data.
- (hyphen)	Enters a hyphen character.
, (comma)	Enters a comma character.
. (period)	Enters a period character.
Enter	Sends CR, CRLF< or SS# M, depending on the mode settings.
PF1-PF4	PF keys have operations assigned to them by the application software in use. Refer to your application's software manual for the programmed uses of these keys.

To enter an auxiliary key:

Press the key(s) while the terminal is in Keypad mode. Or, scan the bar code in Appendix A.

Top-Row Function Keys

VT220/320/340 terminals support function keys F1 through F20. Keys F1 through F5 are used for hold screen, print screen, set-up, data/talk, and break. The terminal supports only the break function. For VT220/320/340, F1 through F4 are PF1 through PF4.

Top-Row Function Key	Description	
F5 (Break)	Sends a break function to the host.	
F6-F20	Are user-defined keys (UDKs) that have operations assigned to them by the application software in use. Refer to your application's software manual for their uses.	

VT100 terminals only support top-row function keys F11 (Escape), F12 (Backspace), and F13 (Line feed).

To enter a top-row function key:

Press the key(s) listed in the section for the terminal. Or, scan the bar code in Appendix A.

Transmission Mode

Use the transmission mode (labeled "Mode" on the overlay) to toggle between Line Edit (block) mode and Character mode. These modes are described in Section 6, "Programming."

When Lock mode is disabled, you can press the Mode key to toggle between Line Edit (block) mode and Character mode. When Lock mode is enabled, you cannot toggle between the modes. By default, Lock mode is disabled. You can configure Lock mode through the TE configuration menus. For information about the menus for 2415, 2425, 2455, and 248X terminals, see Section 4. For information about the menus for the 6400 or 5055 computer, refer to the computer's user manual.

Local Edit Mode

If your application software program supports local editing, you can use the terminal in Local Edit Mode, a feature of the VT330/VT340 terminal. Local Edit Mode is described in Section 6.

VT/ANSI Printing

You can print data from a VT/ANSI host. If you are using a 2415, 2425, 2455, or 248X terminal, you can use different methods to connect it to your printer depending on the type of terminal and printer you have.

To connect your terminal to a printer, refer to the terminal's user manual for instructions.

Using the Print Modes

The following chart defines the print modes you can use with the VT/ANSI TE application.

Mode	Description
Auto print	Prints each line after the cursor leaves that line using a carriage return or when auto-advancing through fields. This mode can be turned on and off from a VT/ANSI host.
Printer controller	Prints all data from a VT/ANSI host. This mode should be turned on and off from the host because all host screens are printed without allowing the user to respond. You cannot log on or off while in this mode.
Print cursor line	Prints the line that the cursor is on. This mode can only be turned on from a VT/ANSI host and turns off after the line prints.
Print form feed	After a screen is printed, the printer advances the printed screen out of the printer. This mode can be turned on and off from a VT/ANSI host.

To send commands from the host, refer to the programmer's guide for your VT/ANSI host for help.

Configuring Printing and Scanning Options

The following instructions explain how to set printing and scanning options. The method depends on the type of terminal you are using.

2415, 2425, 2455, or 248X terminal:

- 1. Connect your terminal to a printer.
- 2. Open the TRAKKER Antares 2400 Menu System.
- 3. Configure the terminal's serial port to match the parameters set for the serial port on the printer. Flow Control must be set to XON/XOFF on both the terminal and the printer. For help configuring the parameters, refer to your terminal's user manual.

If the terminal will receive data from a scanner, and if you enable the RS232 Stream option for the terminal, set the scanner options as follows:

- ► For the Configurable protocol, set the scanner preamble/postamble to STX/ETX (0x02/0x03).
- ▶ For the Binary protocol, set the scanner preamble to STX (0x02) with no postamble.

In both cases, Full ASCII should be enabled. The baud rate, data bits, stop bits, and parity must match the terminal's serial port settings.

To configure the terminal's serial port, do the following:

- 1. Open the TRAKKER Antares 2400 Menu System firmware.
- 2. From the Main Menu, choose Configuration Menu→Communications Menu→Serial Port.
- 3. Configure the serial port parameters. For help, refer to the terminal's user manual.

To set the RS232 Stream option, do the following:

- 1. Open the TE configuration menus. For the correct key sequence, see Section 1, "Getting Started."
- 2. From the Main Menu, choose 1) **Set-up Parms**.
- 3. At the **Enter Password** prompt, enter **cr52401**.
- 4. Choose 3) Protocol Opts.
- 5. Choose 6) VT/ANSI.
- 6. Choose 7) More.
- 7. Choose **7**) **More**.
- 8. Enable or disable the RS232 Stream option.

6400 or 5055 computer:

- 1. Open the TE configuration menus. For the correct key sequence, see Section 1, "Getting Started."
- 2. From the Main Menu, choose 1) **Set-up Parms**.
- 3. At the **Enter Password** prompt, enter **cr52401**.
- 4. Choose 3) Protocol Opts.
- 5. Choose 6) VT/ANSI.
- 6. Choose **7**) **More**.
- 7. Choose 4) RS232 Setup.
- 8. Set the baud rate, parity, stop bits, data bits, or flow.

Section 3

Using the Terminal's Keyboard

Your terminal has a special keyboard that contains most of the keys available on your VT/ANSI terminal keyboard. Use the keyboard to enter data in the TE screens.

The keys on the keyboard have their main character or operation marked directly on the key itself. To access that character or operation, just press the key.

You can access TE commands and functions printed above the keys by pressing key combinations. For example, on a 2415, 2425, 2455, or 248X, you can use the Function Left ($\neg f$), Function Right ($\neg f$), Shift ($^{\land}$), and Control ($^{\land}$) keys to access characters or functions listed above the keys.

2415 Terminal

Your 2415 terminal has one of these keyboards:

- ▶ 55-key
- ▶ 37-key numeric
- ▶ 37-key function numeric

Figure 3-1 shows the 55-key keyboard.

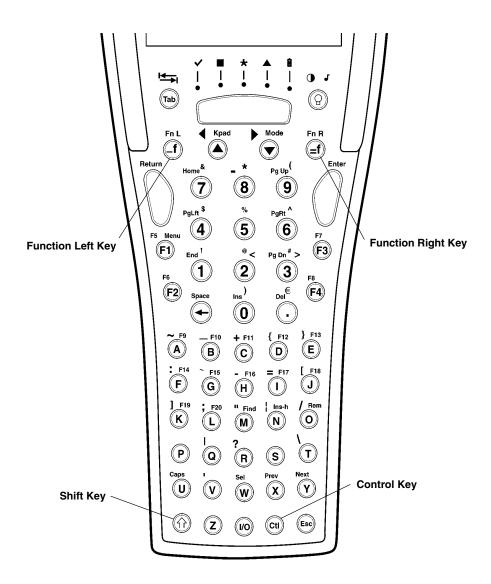


Figure 3-1 2415 Terminal 55-Key Keyboard

Figure 3-2 shows the 37-key numeric keyboard, which has alphabetic keys in the primary plane.

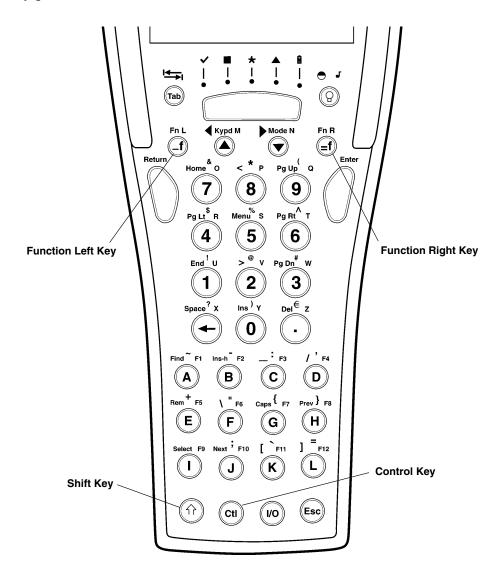


Figure 3-2 2415 Terminal 37-Key Numeric Keyboard

Figure 3-3 shows the 37-key function numeric keyboard, which has function keys in the primary plane.

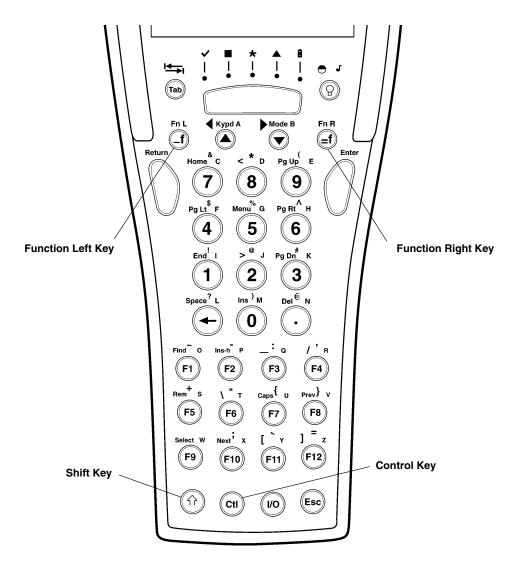


Figure 3-3 2415 Terminal 37-Key Function Numeric Keyboard

For help with using the keyboard, refer to the TRAKKER Antares 241X Hand-Held Terminal User's Manual (P/N 069538).

2415 Cursor Keys

To Enter	Press the Keys
Window/viewport up	A
Window/viewport down	▼
Window/viewport right	④
Window/viewport left	⑤ ▲

2415 Paging Keys

To Enter	Press the Keys
Page up	(1) (9)
Page down	① ③
Page right	(1) (6)
Page left	(1) (4)

2415 Standard Keys

To Enter	Press the Keys
Numbers	0 - 9
Symbols	f or f , plus corresponding key.

2415 Function Keys

Press the Key(s)

		37-Key Numeric	37-Key Function
To Enter	55-Key Keyboard	Keyboard	Numeric Keyboard
Back Tab	Tab	(f) (Tab)	(f) (Tab)
Backspace	igodot	igodot	\odot
Caps Lock	(f) (U)	<u>f</u> G	(f) (F7)
Ctrl	(Ct)	Ctl	(Ctt)
Delete	① ①	(1) (.)	f
Forward Tab	Tab	Tab	Tab
Return	0	0	0
Shift	\Diamond	\Diamond	\odot
Space bar	① ←	() ⊕	④

2415 Editing Keys

Press the Keys

To Enter	55-Key Keyboard	37-Key Numeric Keyboard	37-Key Function Numeric Keyboard
Find	(f) (M)	(f) (A)	(f) (F1)
Insert here		(f) (B)	(f) (F2)
Next screen	(f) (y)	<u>_f</u> <u>J</u>	(f) (F10)
Prev screen	(f) (X)	(f) (H)	f F8
Remove	f o	(f) (E)	
Select	(f) (W)	(f) (1)	(F9)

2415 Top-Row Function Keys

Press the Key(s)

To Enter	55-Key Keyboard	37-Key Numeric Keyboard	37-Key Function Numeric Keyboard
F5 (Break)	(f) (F1)	(a) (E)	(F5)
F6	(f) (F2)	(a) (F)	F6
F7	f F 3	(a) (G)	(F7)
F8	f F 4		(FB)
F9			(F9)
F10	● B	(a) (J)	(F10)
F11	(f) (C)	(a) (K)	(F11)
F12			(F12)
F13	(E)	Not supported.	Not supported.
F14	f F	Not supported.	Not supported.
F15	f G	Not supported.	Not supported.
F16	■f) (H)	Not supported.	Not supported.
F17	f	Not supported.	Not supported.
F18	(a)	Not supported.	Not supported.
F19	 (€) (K)	Not supported.	Not supported.
F20	(a) (b)	Not supported.	Not supported.

2415 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press ⋄ ▼.

2415 Auto-Login Restart

To enter Auto-Login Restart, scan the bar code in Appendix A.

2415 Control Keys

		Press the Keys	
To Enter	55-Key Keyboard	37-Key Keyboard	
FS (file separator)	(Ct) (F1)	Ct) (a) (A)	
GS (group separator)	Ctl) (F2)	\bigcirc th \bigcirc f \bigcirc B	
RS (record separator)	Ct) F3	Ct) of C	
US (unit separator)	Ctl) (F4)	Ct) (T) (D)	
NUL (null)	(C1) (D)	(Ct) (D)	

2415 VT/ANSI Additional Functions

	Press the Keys	
То	55-Key Keyboard	37-Key Keyboard
Access TE configuration menus	(f) (F1)	(f) (5)
Toggle between Application mode and Numeric Keypad mode		the TE configuration menus or core information, see Section 4.

2425 Terminal

Figure 3-4 shows the keyboard for the 2425 terminal.

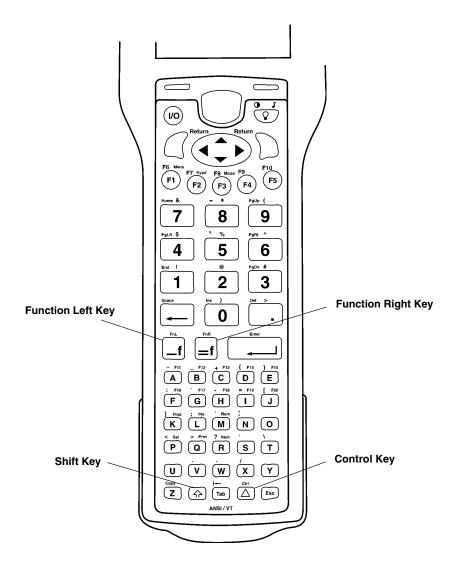


Figure 3-4 2425 Terminal Keyboard

For help with using the keyboard, refer to the TRAKKER Antares 2420 and 2425 Hand-Held Terminal User's Manual (P/N 064024).

2425 Cursor Keys

To Enter	Press the Keys
Window/viewport up	_f A
Window/viewport down	_ f ▼
Window/viewport right	_f >
Window/viewport left	_f

2425 Paging Keys

To Enter	Press the Keys
Page up	_f _ g
Page down	_f _3
Page right	_f _ 6
Page left	_f _4

2425 Standard Keys

To Enter	Press the Keys
a-z	A – Z
A-Z	
Numbers	0 - 9
Symbols	f or f , plus corresponding key.

2425 Function Keys

To Enter	Press the Keys
Back Tab	_f _Tab
Backspace	←
Caps Lock	_f Z
Ctrl	
Delete	_f .
Forward Tab	Tab
Return	\mathcal{Q} or \mathcal{D}
Shift	\Diamond
Space bar	_f

2425 Editing Keys

To Enter	Press the Keys
Find	_f
Insert here	
Next screen	=f R
Prev screen	=f Q
Remove	=f M
Select	_f P

2425 Top-Row Function Keys

To Enter	Press the Keys
F5 (Break)	(F5)
F6	_f (P)
F7	_f @
F8	_f ®
F9	_f @
F10	_f 65
F11	<u></u> f A
F12	_f B
F13	=f C
F14	
F15	=f E
F16	=f F
F17	
F18	=f H
F19	
F20	

2425 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press [=f] [78].

2425 Auto-Login Restart

To enter Auto-Login Restart, press [=f] (75) or scan the bar code in Appendix A.

2425 Control Keys

To Enter	Press the Keys
FS (file separator)	△ P
GS (group separator)	
RS (record separator)	
US (unit separator)	
NUL (null)	(a)

2425 VT/ANSI Additional Functions

То	Press the Keys
Access TE configuration menus	<u></u> f (P)
Toggle between Application mode and Numeric Keypad mode	No keys available. Use the TE configuration menus or set from the host. For more information, see
	Section 4.

2455 Terminal

Figure 3-5 shows the keyboard for the 2455 terminal.

NOTE:

You must use the 2455 keyboard (P/N 067028) with the TE applications.

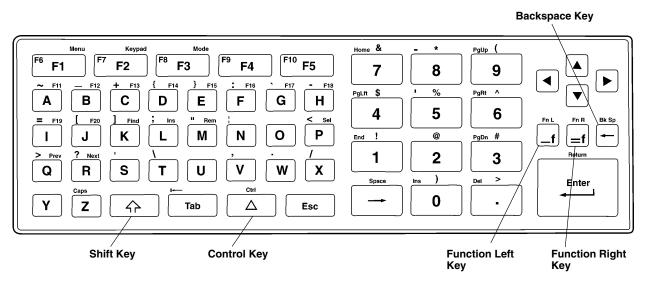


Figure 3-5 2455 Terminal Keyboard

For help with using the keyboard, refer to the TRAKKER Antares 2455 Vehicle-Mount Terminal User's Manual (P/N 067358).

2455 Cursor Keys

To Enter	Press the Keys
Window/viewport up	_f _
Window/viewport down	_f ▼
Window/viewport right	_f >
Window/viewport left	_f ◀

2455 Paging Keys

To Enter	Press the Keys
Page up	_f 9
Page down	_f 3
Page right	_f 6
Page left	_f 4

2455 Standard Keys

To Enter	Press the Keys	
a-z	A - Z	
A-Z		
Numbers	0 - 9	
Symbols	f or f , plus corresponding key.	

2455 Function Keys

To Enter	Press the Keys
Back Tab	_f _Tab
Backspace	←
Caps Lock	_f Z
Ctrl	
Delete	_f
Forward Tab	Tab
Return	\land \blacksquare
Shift	\Diamond
Space bar	→

2455 Editing Keys

To Enter	Press the Keys	
Find	≡f	
Insert here	=f L or $-$ f o	
Next screen	=f) R	
Prev screen		
Remove	_f M	
Select		

2455 Top-Row Function Keys

To Enter	Press the Keys	
F5 (Break)	F5	
F6	f Fi	
F7	_f	
F8	f F3	
F9	_f F4	
F10	_f F5	
F11		
F12	<u>=</u> f) B	
F13		
F14		
F15	_f)	
F16	f	
F17		
F18	=f) H	
F19	=f)	
F20		

2455 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press [=f] [F3].

2455 Auto-Login Restart

To enter Auto-Login Restart, press for scan the bar code in Appendix A.

2455 Control Keys

To Enter	Press the Keys
FS (file separator)	△ F1
GS (group separator)	△ F2
RS (record separator)	
US (unit separator)	
NUL (null)	

2455 VT/ANSI Additional Functions

То	Press the Keys
Access TE configuration menus	_f F1
Toggle between Application mode and Numeric Keypad mode	No keys available. Use the TE configuration menus or set from the host. For more information, see Section 4.

248X Terminal

Figure 3-6 shows the keyboard for the 248X terminal.

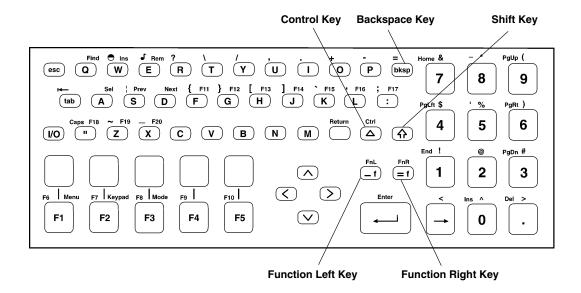


Figure 3-6 248X Terminal Keyboard

For help with using the keyboard, refer to the TRAKKER Antares 248X Stationary Terminal User's Manual (P/N 066960).

248X Cursor Keys

To Enter	Press the Keys
Window/viewport up	f A
Window/viewport down	_f
Window/viewport right	_f >
Window/viewport left	_f <

248X Paging Keys

To Enter	Press the Keys
Page up	_f 9
Page down	_f 3
Page right	_f 6
Page left	_f _4

248X Standard Keys

To Enter	Press the Keys
a-z	A - Z
A-Z	
Numbers	0 - 9
Symbols	[f] or $[a, b]$, plus corresponding key.

248X Function Keys

To Enter	Press the Keys
Back Tab	_f tab
Backspace	bksp
Caps Lock	_f n
Ctrl	
Delete	_f
Forward Tab	tab
Shift	\Diamond
Space bar	→

248X Editing Keys

To Enter	Press the Keys
Find	_f Q
Insert here	=f w or $-$ f o
Next screen	
Prev screen	=f S
Remove	=f E
Select	=f A

248X Top-Row Function Keys

To Enter	Press the Keys
F5 (Break)	F5
F6	_f F1
F7	_f F2
F8	_f F3
F9	_f F4
F10	_f F5
F11	f
F12	f G
F13	=f
F14	f J
F15	■f
F16	
F17	f
F18	<u>=</u> f
F19	
F20	<u>=</u> f

248X Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press [f] [F3].

248X Auto-Login Restart

To enter Auto-Login Restart, press [=f] [F5] or scan the bar code in Appendix A.

248X Control Keys

To Enter	Press the Keys
FS (file separator)	△ FI
GS (group separator)	
RS (record separator)	
US (unit separator)	
NUL (null)	

248X VT/ANSI Additional Functions

То	Press the Keys
Access TE configuration menus	<u>-</u> f F1
Toggle between Application mode and Numeric Keypad mode	No keys available. Use the TE configuration menus or set from the host. For more information, see Section 4.

6400 Computer

Your 6400 computer has either a 51-key keyboard (Figure 3-1) or a 41-key keyboard (Figure 3-2).

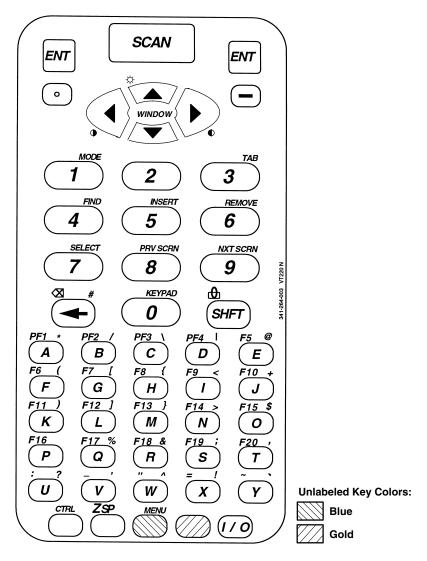


Figure 3-1 6400 Computer 51-Key Keyboard

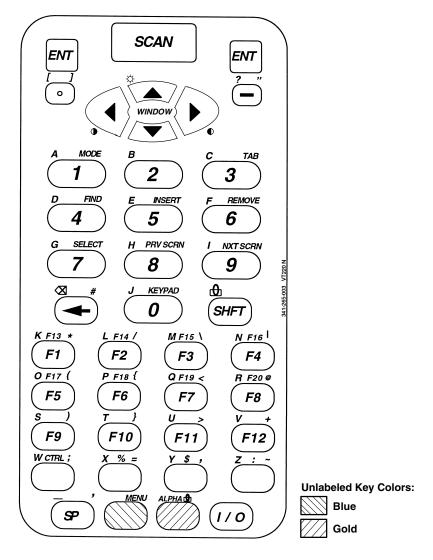


Figure 3-2 6400 Computer 41-Key Keyboard

The special characters and functions printed above the keys are color-coded to correspond with the matching shift keys. The shift keys are as follows.

[GREEN]	The green [SHFT] puts the keyboard into green shift mode.
[GOLD]	The gold key puts the keyboard into gold shift mode. Press [GOLD]
	plus a keyboard key to type a character or do an operation printed in gold on the overlay.
[BLUE]	The blue key puts the keyboard into blue shift mode. Press [BLUE]
	plus a keyboard key to do an operation printed in blue on the overlay.

The 51-key keyboard has two white, unlabeled keys in the bottom row of the keyboard. Following are the keys' functions when they are unshifted (in the primary plane):

- ▶ The white key with "CTRL" printed above it is the Control key ([CTRL]) which, in combination with other keys, does control functions.
- ▶ The white key with "SP" printed above it is the Space key ([SP)], which types one space.

The 41-key keyboard has four white, unlabeled keys near the bottom row of the keyboard. Following are the key's functions when they are in the primary plane:

- ▶ The white key with "CTRL" printed above it is the control key ([CTRL]) which, in combination with other keys, does control functions.
- ▶ The white key with "%" printed above it is the percent key ([%]), which types a percent sign.
- ▶ The white key with "\$" printed above it is the dollar key ([\$]), which types a dollar sign.
- ▶ The white key with ":" printed above it is the colon key ([:]), which types a colon.

For help with using the keyboard, refer to the PEN*KEY Model 6400 User's Guide (P/N 961-047-093).

Using the 41-Key Keyboard

The 41-key keyboard (Figure 3-2) has standard numeric and [ENT] keys, plus application-defined function keys. The keys are color-coded according to function to make recognition and key entry easier.

Because a PEN*KEY computer with a 41-key keyboard does not have alphabetic keys in its primary plane, follow these procedures to enter passwords and cold-start the computer:

- ▶ To enter the password for the SET-UP PARMS firmware menu press [SHFT] [BLUE] [3] (a "C") and then [SHFT] [BLUE] [F8] (an "R"). Then press the correct numbers, which are "52401."
- ▶ To initiate the COLD START? firmware menu option, press [BLUE] [\$] to answer "yes."

You can use one of two methods to type letters on the 41-key keyboard: standard mode or alpha lock mode. When engaged, alpha lock mode switches the alphabetic keys with the function keys. That is, it moves lowercase alphabetic keys from their standard [BLUE] plane to the primary plane. It moves uppercase alphabetic keys from their standard [SHFT] [BLUE] plane to the [SHFT] plane. Alpha lock provides a faster way to type a series of letters because it reduces the number of key presses.

NOTE:

Alpha lock mode moves only lowercase alphabetic keys to the primary plane.

To engage alpha lock mode press [BLUE] [GOLD]. Then, to type a series of letters, press the correct key combination. The keyboard stays in alpha lock mode until you press [BLUE] [GOLD] again to unlock it.

6400 Cursor Keys

To Enter	Press the Keys
Window/viewport up	[GOLD] [🛕]
Window/viewport down	[GOLD][lacksquare]
Window/viewport right	[GOLD] [▶]
Window/viewport left	[GOLD] [◄]

6400 Paging Keys

To Enter	Press the Keys	
Page up	[BLUE] [▲]	
Page down	$[\mathrm{BLUE}][lacktrianglet]$	
Page right	[BLUE] [▶]	
Page left	[BLUE] [◀]	

6400 Standard Keys

To Enter	Press the Keys
Numbers	[0]-[9]
Symbols	[GOLD] or [BLUE], plus the corresponding key.

6400 Function Keys

To Enter	Press the Key(s)
Ctrl	[CTRL]
Delete	$[BLUE][\leftarrow]$
Delete or Backspace	[←]
Forward Tab	[GOLD] [3]
Lock	[BLUE] [SHFT]
Return	[ENT]
Shift	[SHFT]
Space bar	[SP]

6400 Editing Keys

To Enter	Press the Keys
Find	[GOLD] [4]
Insert here	[GOLD] [5]
Next screen	[GOLD] [9]
Prev screen	[GOLD] [8]
Remove	[GOLD] [6]
Select	[GOLD] [7]

6400 Auxiliary Keys

Press the	Keys
-----------	------

To Enter	51-Key Keyboard	41-Key Keyboard
0-9	[GOLD] [0] [1] - [GOLD] [0] [9]	[GOLD] [0] [1] -[GOLD] [0] [9]
- (hyphen)	[GOLD] [0] [-]	[GOLD] [0] [-]
, (comma)	[GOLD] $[0]+[GOLD]$ $[T]$	[GOLD] [0]+[GOLD] [\$]
. (period)	[GOLD] [0] [.]	[GOLD] [0] [.]
Enter	[GOLD] [0] [ENT]	[GOLD] [0] [ENT]
PF1	[BLUE] [A]	[F1]
PF2	[BLUE] [B]	[F2]
PF3	[BLUE] [C]	[F3]
PF4	[BLUE] [D]	[F4]

6400 Top-Row Function Keys

To Enter	Press (51-Key Keyboard)
F5 (Break)	[BLUE] [E]
F6	[BLUE] [F]
F7	[BLUE] [G]
F8	[BLUE] [H]
F9	[BLUE] [I]
F10	[BLUE] [J]
F11	[BLUE] [K]
F12	[BLUE] [L]
F13	[BLUE] [M]
F14	[BLUE] [N]
F15	[BLUE] [O]
F16	[BLUE] [P]
F17	[BLUE] [Q]
F18	[BLUE] [R]
F19	[BLUE] [S]
F20	[BLUE] [T]

When alpha lock mode is engaged on the 41-key keyboard, it switches the function keys with the alphabetic keys. That is, function keys normally in the primary plane ([F1] through [F12]) move to the [BLUE] plane. Function keys normally in the [SHFT] plane ([F13] through [F20]) move to the [SHFT] [BLUE] plane.

The following chart describes how to do function operations when the 41-key keyboard is in standard mode or alpha lock mode.

Press the Keys

To Enter	Standard Mode	Alpha Lock Mode
F5 (Break)	[F5]	[BLUE] [F5]
F6	[F6]	[BLUE] [F6]
F7	[F7]	[BLUE] [F7]
F8	[F8]	[BLUE] [F8]
F9	[F9]	[BLUE] [F9]
F10	[F10]	[BLUE] [F10]
F11	[F11]	[BLUE] [F11]
F12	[F12]	[BLUE] [F12]
F13	[SHFT] [F1]	[SHFT] [BLUE] [F1]
F14	[SHFT] [F2]	[SHFT] [BLUE] [F2]
F15	[SHFT] [F3]	[SHFT] [BLUE] [F3]
F16	[SHFT] [F4]	[SHFT] [BLUE] [F4]
F17	[SHFT] [F5]	[SHFT] [BLUE] [F5]
F18	[SHFT] [F6]	[SHFT] [BLUE] [F6]
F19	[SHFT] [F7]	[SHFT] [BLUE] [F7]
F20	[SHFT] [F8]	[SHFT] [BLUE] [F8]

6400 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press [GOLD] [1] on the 51- and 41-key keyboards.

6400 Auto-Login Restart

To enter Auto-Login Restart, scan the bar code in Appendix A.

6400 Control Keys

Following are key combinations for the 51-key keyboard.

To Enter	Press (51-Key Keyboard)	
DEL (delete)	[CTRL] [8]	
ESC (escape)	[CTRL] [3]	
FS (file separator)	[CTRL] [4]	
GS (group separator)	[CTRL] [5]	
RS (record separator)	[CTRL] [6]	
US (unit separator)	[CTRL] [7]	

To use the control keys on the 41-key keyboard, press the key combinations in the following chart.

To Do	Standard Mode	Alpha Lock Mode
CTRL A	[CTRL] [BLUE] [1]	[BLUE] [CTRL] [1]
CTRL B	[CTRL] [BLUE] [2]	[BLUE] [CTRL] [2]
$CTRL\ C$	[CTRL] [BLUE] [3]	[BLUE] [CTRL] [3]
CTRL D	[CTRL] [BLUE] [4]	[BLUE] [CTRL] [4]
CTRL E	[CTRL] [BLUE] [5]	[BLUE] [CTRL] [5]
$\operatorname{CTRL} \mathbf{F}$	[CTRL] [BLUE] [6]	[BLUE] [CTRL] [6]
$\operatorname{CTRL} \operatorname{G}$	[CTRL] [BLUE] [7]	[BLUE] [CTRL] [7]
$CTRL\ H$	[CTRL] [BLUE] [8]	[BLUE] [CTRL] [8]
CTRL I	[CTRL] [BLUE] [9]	[BLUE] [CTRL] [9]
$\operatorname{CTRL} \mathbf{J}$	[CTRL] [BLUE] [0]	[BLUE] [CTRL] [0]
$\operatorname{CTRL} K$	[CTRL] [BLUE] [F1]	[BLUE] [CTRL] [F1]
$\operatorname{CTRL} \operatorname{L}$	[CTRL] [BLUE] [F2]	[BLUE] [CTRL] [F2]
CTRL M	[CTRL] [BLUE] [F3]	[BLUE] [CTRL] [F3]
CTRL N	[CTRL] [BLUE] [F4]	[BLUE] [CTRL] [F4]
CTRL O	[CTRL] [BLUE] [F5]	[BLUE] [CTRL] [F5]
CTRL P	[CTRL] [BLUE] [F6]	[BLUE] [CTRL] [F6]
$\operatorname{CTRL}\operatorname{Q}$	[CTRL] [BLUE] [F7]	[BLUE] [CTRL] [F7]
CTRLR	[CTRL] [BLUE] [F8]	[BLUE] [CTRL] [F8]
CTRL S	[CTRL] [BLUE] [F9]	[BLUE] [CTRL] [F9]
$\operatorname{CTRL} \operatorname{T}$	[CTRL] [BLUE] [F10]	[BLUE] [CTRL] [F10]
$\operatorname{CTRL} \operatorname{U}$	[CTRL] [BLUE] [F11]	[BLUE] [CTRL] [F11]
$\operatorname{CTRL} V$	[CTRL] [BLUE] [F12]	[BLUE] [CTRL] [F12]
CTRL W	[CTRL] [BLUE] [CTRL]	[BLUE] [CTRL] [CTRL]
$\operatorname{CTRL} X$	[CTRL] [BLUE] [%]	[BLUE] [CTRL] [%]
$\operatorname{CTRL} \mathbf{Y}$	[CTRL] [BLUE] [\$]	[BLUE] [CTRL] [\$]
$\operatorname{CTRL} \mathbf{Z}$	[CTRL] [BLUE] [:]	[BLUE] [CTRL] [:]

6400 VT/ANSI Additional Functions

То	Press the Keys or Use
Access TE configuration menus	[GOLD] [BLUE]
Toggle between Application	DECKPAM/DECPNM
mode and Numeric Keypad mode	

5055 Computer

Figure 3-3 shows the keyboard for the 5055 computer.

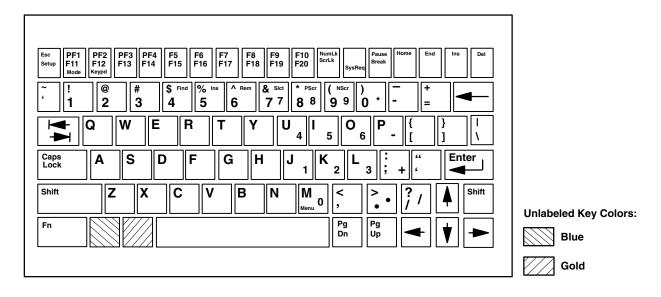


Figure 3-3 5055 Computer Keyboard

The special characters and functions printed on the overlay are color-coded to correspond with the matching shift keys. The shift keys are as follows.

[Shift] Press [Shift] plus a letter to type the letter in uppercase. [BLUE] The blue-colored (Ctrl) key puts the keyboard into blue shift [BLUE] mode. Press [BLUE] plus a keyboard key to do an operation printed in blue, or to send a control character. [GOLD] The gold-colored (Alt) key puts the keyboard into gold shift [GOLD] mode. Press [GOLD] plus a keyboard key to do an operation printed in gold. [NumLk] The green-colored (number lock) key puts the keyboard into [NumLk] mode. Press [NumLk] plus a keyboard key to type a number or character printed in green.

NOTE:

These keys are not operational: Fn, Setup, SysReg, Pause, Home, End, Ins, ScrLk, PgDn, and PgUp.

For help with using the keyboard, refer to the 5055 Data Collection PC User's Guide (P/N 961-054-017).

5055 Cursor Keys

To Enter	Press the Keys
Window/viewport up	[BLUE] ♠
Window/viewport down	[BLUE] ♥
Window/viewport right	[BLUE] -
Window/viewport left	[BLUE] ←

5055 Paging Keys

Press the Keys
[GOLD] ▲
[GOLD] ♥
[GOLD] —
[GOLD] ◄ −

5055 Standard Keys

To Enter	Press the Key(s)
a-z	[A]-[Z]
A-Z	[Shift]+[A] - [Shift]+[Z]
Numbers	[0]-[9]
Symbols	The symbol key, or [Shift] plus the corresponding key.

5055 Function Keys

To Enter	Press the Key(s)	
Back Tab	—	
Ctrl	[BLUE]	
Delete	←	
Forward Tab	→	
Lock	[Caps Lock]	
Return	[Enter]	
Shift	[Shift]	
Space bar	[Space bar]	

5055 Editing Keys

To Enter	Press the Key(s)	
Find	[GOLD]+[4]	
Insert here	[GOLD]+[5]	
Next screen	[GOLD]+[9]	
Prev screen	[GOLD]+[8]	
Remove	[GOLD]+[6]	
Select	[GOLD]+[7]	

5055 Auxiliary Keys

To Enter	Press the Keys
0-9	[GOLD]+[PF2]+[0] - [GOLD]+[PF2]+[9]
- (hyphen)	[GOLD]+[PF2]+[-]
, (comma)	[GOLD]+[PF2]+[M]
. (period)	[GOLD]+[PF2]+[.]
Enter	[GOLD]+[PF2]+[ENTER]
PF1	[PF1]
PF2	[PF2]
PF3	[PF3]
PF4	[PF4]

5055 Top-Row Function Keys

To Enter	Press the Key(s)	
F5 (Break)	[F5]	
F6	[F6]	
F7	[F7]	
F8	[F8]	
F9	[F9]	
F10	[F10]	
F11	[BLUE]+[PF1]	
F12	[BLUE]+[PF2]	
F13	[BLUE]+[PF3]	
F14	[BLUE]+[PF4]	
F15	[BLUE]+[F5]	
F16	[BLUE]+[F6]	
F17	[BLUE]+[F7]	
F18	[BLUE]+[F8]	
F19	[BLUE]+[F9]	
F20	[BLUE]+[F10]	

5055 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press [GOLD]+[PF1].

5055 Auto-Login Restart

To enter Auto-Login Restart, scan the bar code in Appendix A.

5055 Control Keys

To Enter	Press the Keys
SOH	[BLUE]+[A]
STX	[BLUE]+[B]
ETX	[BLUE]+[C]
EOT	[BLUE]+[D]
ENQ	[BLUE]+[E]
ACK	[BLUE]+[F]
BEL	[BLUE]+[G]
BS	[BLUE]+[H]
HT	[BLUE]+[I]
LF	[BLUE]+[J]
m VT	[BLUE]+[K]
FF	[BLUE]+[L]
CR	[BLUE]+[M]
SO	[BLUE]+[N]
SI	[BLUE]+[O]
DLE	[BLUE]+[P]
DC1, X-ON	[BLUE]+[Q]
DC2	[BLUE]+[R]
DC3, X-OFF	[BLUE]+[S]
DC4	[BLUE]+[T]
NAK	[BLUE]+[U]
SYN	[BLUE]+[V]
ETB	[BLUE]+[W]
CAN	[BLUE]+[X]
EM	[BLUE]+[Y]
SUB	[BLUE]+[Z]
ESC	[ESC]
FS	[BLUE]+[1]
GS	[BLUE]+[2]
RS	[BLUE]+[3]
US	[BLUE]+[4]
DEL	[Del]
_	t—3

5055 VT/ANSI Additional Functions

То	Press the Keys or Use
Access TE configuration menus	[GOLD]+[M]
Toggle between Application	DECKPAM/DECPNM
mode and Numeric Keypad mode	

Section 4

Using the Trakker Antares' Terminal **Emulation Menus**

NOTE:

This section contains the TE configuration menus for 2415, 2425, 2455, and 248X terminals. For information about the configuration menus for the 6400 or 5055 computer, refer to the computer's user manual.

You can configure several options for VT/ANSI TE on your Trakker Antares® terminal, including:

- ▶ UDP Plus or TCP/IP communications
- ► VT/ANSI options
- ▶ Main Menu password

This section lists ALL TE parameters. If a certain parameter does not apply to your terminal, the parameter will NOT appear in the TE configuration menus.

The CFGLIT.DAT file specifies the text of the TE configuration menus. This section assumes you are using the default settings in CFGLIT.DAT. To customize CFGLIT.DAT, see Section 5, "Customizing Your Configuration."

Navigating Through the Menus

The following paragraphs describe how to navigate through the TE configuration menus.

Using the Enter Key

Press the terminal's [Enter] key to return to a previous TE configuration menu. Press [Enter] several times to return to the Main Menu from a submenu. This key also accepts the displayed or keyed input.

Using the Numeric Keys

Several menus have numbered options. Press the corresponding numeric key to make a selection.

Pressing a number may bring up a submenu. Use the submenu to further modify the choice you made in the parent menu. After the modifications, you may return to the parent menu to make additional selections. (This depends on the menu and function.) Also, you may press a numeric key to exit a menu or cold start the terminal. These situations are covered later in this section.

Some menus require you to enter a number, but do not necessarily have simple choices such as 1, 2, 3, 4, etc. Instead, you may have to enter a number within a range of numbers.

Enabling or Disabling Options

You can enable or disable some numbered menu options. If the number for an option is highlighted (appears in reverse video), that option is ON or enabled. If an option is not highlighted, the option is disabled. After you enable or disable an option, you can make additional selections from the same menu.

Using the Y ("Yes") Key

Several displays provide warning that a certain action can cause your terminal to lose data stored in memory. Press the Y ("yes") key to indicate that you understand the consequences of your action and the terminal should proceed as instructed. Press any other key to exit the menu without executing your original choice.

Configuring TE Parameters

You can access the TE configuration menus when the initialization screens appear or once you establish a TE session. The TE initialization screens appear each time you reboot the terminal or restart your application.

NOTE:

If you are using a terminal with TCP/IP, you cannot enter the TE configuration menus when the terminal is trying to connect to the host.

To configure TE parameters:

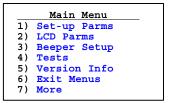
At the initialization screens or anywhere in a TE session, access the Main Menu by pressing the keys in the following chart.

Terminal	Key Sequence
2415	(f) (F) (55-key keyboard)
	① ⑤ (37-key keyboard)
2425	
2455 and 248X	<u>=</u> f

NOTE:

You can also access the Main Menu by scanning the bar code label in Appendix A, "Bar Code Scanning."

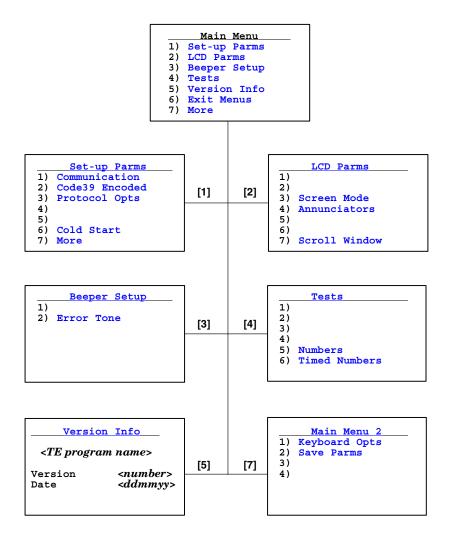
The Main Menu appears:



The following figure shows the structure of the TE configuration menus.

NOTE:

Some parameters for 2415, 2425, 2455, and 248X terminals are available through the TRAKKER Antares 2400 Menu System. They are not reproduced in the TE configuration menus. For more information about the menu system, refer to the terminal's user manual.



Set-Up Parms Menu

The Set-up Parms menu (option 1 on the Main Menu) is password-protected to prevent unauthorized users from changing parameters. You can change the password by customizing the parameter's set-up file (CONFIG.DAT). For more information about changing the password, see Section 5, "Customizing Your Configuration."

NOTE:

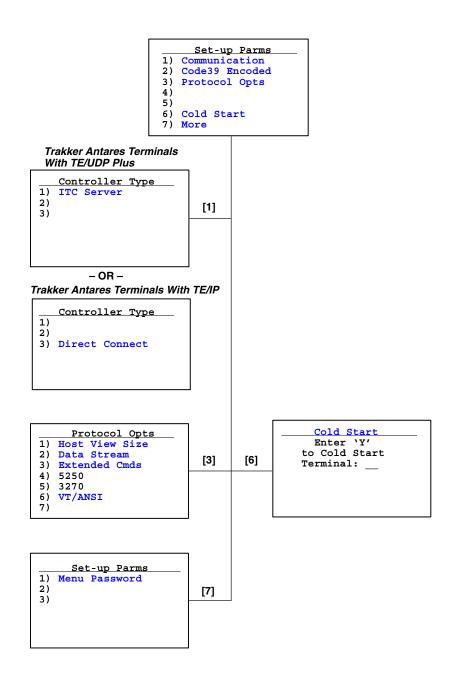
You can also set the password for UDP Plus terminals from the DCS 300.

To use the Set-up Parms menu:

- 1. Press [1] on the Main Menu.
- 2. At the Enter Password prompt, enter the password. (You should not press [Enter] here.) The default password is:

cr52401

The following figure shows the Set-up Parms menus and submenus.

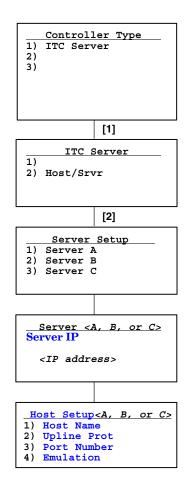


Communication

The communication option for the 2415, 2425, 2455, and 248X with UDP Plus is ITC Server. The communication option for TCP/IP is Direct Connect.

ITC Server

ITC Server options are as follows:



To set the options, select ITC Server, Host/Srvr Setup, and then the Server Setup option (Server A, B, or C).

Server IP <A, B, or C>

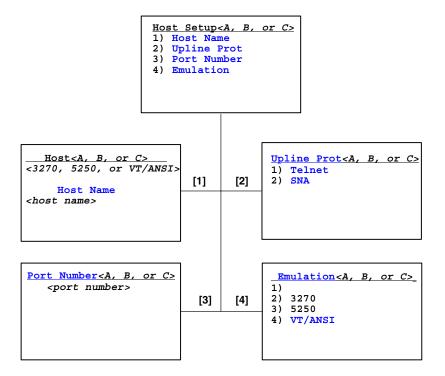
When the terminal boots, the TE program should enter the Server <A> IP address as follows:

- ▶ If a nonzero IP address exists for the Host A.Server IP parameter in CONFIG.DAT, the TE program automatically enters that address.
- ▶ If the Host A.Server IP parameter in CONFIG.DAT is blank or zero, the TE program automatically enters the IP address set for the DCS 300 in the terminal's firmware.

If you are using the Server or Server <C> option as a fallback DCS 300, enter the server's IP address or DNS name.

Host Setup <A, B, or C>

Menu options are as follows:



Host Name

The host name can be 16 or fewer characters in length (with no spaces). It is case-sensitive and must match a host name in the list of available hosts defined on the DCS 300, or remain blank. The name can also be the IP address of the host to which you want to connect. Enter the IP address as four decimal numbers separated by periods.

If you have linked a terminal with a host name on the DCS 300, or configured a default host on this DCS 300, you do not need to enter a host name on this screen.

The terminal displays a list of available hosts if these conditions are met:

- ► The DCS 300 contains multiple hosts
- ▶ The terminal is not linked with a host name on the DCS 300
- ► The host name is blank

The user can then select the host from the list.

Upline Protocol

When enabled, upline protocol options do the following:

Telnet	Forces the DCS 300 to create a Telnet connection to the host.
(Default)	
SNA	Forces the DCS 300 to create an SNA connection to the host.

Port Number

This option overrides the port number set for the upline if you have entered a host name and selected Telnet as your upline protocol. The default port number is 0. The maximum port number is 65535.

Emulation

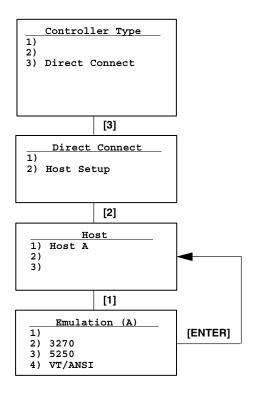
Use this option to tell the terminal the type of each host computer. The default is 3270.

NOTE:

You can also set the type through the Data Stream option on the Protocol Opts menu.

Direct Connect

Direct Connect options are as follows:



To set the options, select Direct Connect, Host Setup, and then Host A. Use the Emulation (A) option to tell the terminal the type of each host computer. The default is 3270.

NOTE:

You can also set the emulation type through the Data Stream option on the Protocol Opts menu.

Code 39 Encoded

By default, Encoded Code 39 is disabled. When you enable this option, the key press sequences for Encoded Code 39 are used. For more information, see Appendix A, "Bar Code Scanning."

Protocol Opts Menu

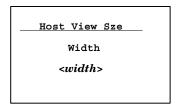
Use the Protocol Opts menu to designate the type of terminal emulation the host supports. You can also use it to designate additional commands and command sets. The menu is as follows:

```
Protocol Opts

1) Host View Sze
2) Data Stream
3) Extended Cmds
4) 5250
5) 3270
6) VT/ANSI
7)
```

Host View Size

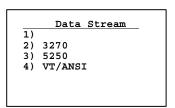
Use Host View Sze to set the format of display information sent from the host computer:



For VT/ANSI TE, the size is 80.

Data Stream

Use this option to specify the data stream the host uses:



NOTE:

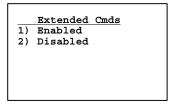
You can also set the emulation type through the ITC Server or Direct Connect menu.

For information about 3270 or 5250 TE, refer to the following manuals:

- ► TE 2000 3270 Terminal Emulation Programmer's Guide (P/N 977-055-003)
- ► TE 2000 5250 Terminal Emulation Programmer's Guide (P/N 977-055-004)

Extended Commands

Use the Extended Commands option to enable or disable extended commands:



By default, extended commands are disabled. For more information about extended commands, see Section 7.

VT/ANSI

Following are VT/ANSI menu options:

	VT/ANSI
1)	DEL to BS
2)	CR to CRLF
3)	Auto Entr Scn
4)	Auto Tab Scan
5)	Local Echo
6)	AnswerBack
7)	More

When enabled, options do the following:

DEL to BS (Default: disabled)	Causes the [CLEAR] key to delete the character to the left of the cursor position, and moves the cursor back one space. When this option is disabled, the [CLEAR] key deletes the character at the cursor position.
CR to CRLF	Causes the [ENTER] key to perform a carriage return and a
(Default: disabled)	line feed. When this option is disabled, the [ENTER] key performs a carriage return only.
Auto Entr Scn (Default: disabled)	Appends the Enter key at the end of a good scan.
	▶ NOTE: You cannot enable Auto Tab Scan and Auto Enter Scan at the same time.
Auto Tab Scan (Default: disabled)	Causes the cursor to tab forward to the next input field when a good scan is obtained.
Local Echo (Default: disabled)	Allows characters to be displayed from terminal memory, but not from host memory.

AnswerBack (Default: null string) Enables you to enter a character string that is sent to the host in response to an inquiry (hexadecimal 05). The range

If you enter a control character, it is sent out. Control characters are:

ACK	\mathbf{FF}
BEL	FS
BS	GS
CAN	HT
CR	\mathbf{LF}
DC1	NAK
DC2	NUL
DC3	RS
DC4	\mathbf{SI}
DLE	\mathbf{SO}
$\mathbf{E}\mathbf{M}$	SOH
ENQ	STX
EOT	SYN
ESC	SUB
ETB	$\overline{\mathrm{US}}$
ETX	VT

Following is the submenu for the More option:

	VT/ANSI
1)	Screen Lock
2)	
3)	UserKey Locked
4)	
5)	VT220 Mode
6)	Lock Mode
7)	More

When enabled, the first two options do the following:

Screen Lock (Default: disabled)	Sets up and locks the screen to a specified size. The terminal ignores any characters falling outside this screen size.
UserKey Locked (Default: disabled)	You can get a command from the host (DCS) that defines the function keys. When UserKey Locked is enabled, the host ignores this command.

VT220 Mode

Use VT220 Mode to select the operational mode:

	VT220 Mode
1)	Char
2)	Block

When enabled, options do the following:

Char Sets the mode to Character mode. The terminal sends each

(Default) character as it is pressed.

Block Sets the mode to Line Edit (block) mode. The terminal sends a

block of characters when a terminating key is pressed.

Lock Mode

You can use the Mode key on the terminal's keyboard to toggle between Line Edit (block) mode and Character mode. Use the Lock Mode option to disable the Mode key in the VT/ANSI data stream. By default, Lock mode is disabled.

More

The More menu has these options:

	VT/ANSI
1)	•
2)	Term Setup
	Send XON
4)	Keypad Mode
5)	VT Cursor Mode
6)	Terminal Mode
7)	More

Options do the following:

(Default: enabled)

Term Setup	Sets the terminal type of the host system. The supported
(Default: $VT340$)	terminal types are ANSI, VT100, VT220, VT320, and VT340.

Send XON Enables or disables XON.

Keypad Mode Sets the keypad mode to Application or Numeric. These options

(Default: Numeric) generate different key codes. For a list of key codes, see

Section 6, "Programming."

Numeric mode generates ANSI cursor control ESC sequences that correspond to what appears on the face of the keys.

Application mode generates application ESC sequences for the

key code. For help, refer to your VT manual.

VT Cursor Mode Sets the cursor mode to Application or Cursor. These options

(Default: Cursor) generate different key codes.

Cursor mode generates ANSI cursor control ESC sequences that correspond to what appears on the face of the cursor key.

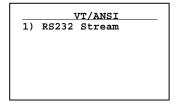
Application mode generates application ESC sequences for the

key code. For help, refer to your VT manual.

Terminal Mode (VT220/320 only) Sets the terminal mode that corresponds to your terminal type. This option sets the mode VT-series terminals use to exchange (Default: 7-bit) escape sequences, control commands, and status reports with an

application.

VT220 - 7-bit or 8-bit VT320 - 7-bit or 8-bit Following is the submenu for the More option:



By default, RS232 Stream is disabled. If you enable it, the terminal watches the RS-232 port for activity. If activity exists, the terminal reads in the RS-232 data and sends it to the host. This enables support for fixed-station scanners or scales that send only RS-232 data without having the host send an extended command to enable the RS-232 port.

NOTE:

If you access the TE configuration menus when this option is enabled, all RS-232 data received during this time is lost.

For information about setting scanner options when RS232 Stream is enabled, see Section 2, "Using Terminal Emulation Applications."

Cold Start Option

Use the Cold Start option to reset all TE values to the stored configuration in CONFIG.DAT.

> Cold Start to Cold Start

To cold start the terminal:

- 1. Press [Y]. The terminal reboots.
- 2. Open the TRAKKER Antares 2400 Menu System.
- 3. Use the File Manager option to restart the TE program. For help, refer to the terminal's user manual.

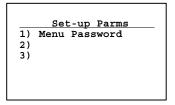
To return to the Set-up Parms menu without cold-starting the terminal, press an alphabetic key other than [Y].

More Menu

Use the Menu Password option to enable password protection for the TE configuration menus. When you enable the password, the terminal prompts the user for a password before it displays the Main Menu. The password is disabled by default.

To enable the Menu Password:

1. Press [7] (More) on the Set-up Parms menu. The following screen appears:



- 2. Press [1].
- 3. At the Enter Password prompt, type the following password: **3193693** This is a fixed password set by Intermec[®].

NOTE:

The Menu Password is now enabled. This is indicated by the "1)" changing to reverse video.

- 4. Press [ENTER] twice to return to the Main Menu.
- 5. Press [6] (Exit Menus) on the Main Menu to exit the TE configuration menus.

If the Menu Password is enabled when you try to enter the Main Menu, you are prompted for a password. If you enter an incorrect password, you exit to where the display was at previously. If you enter the correct password, the Main Menu appears. Note that if you select the Set-up Parms option on the Main Menu, you must still enter the password for Set-up Parms.

To disable the menu password, press [1] on the Set-up Parms More menu. The "1)" changes to normal video, which indicates that the Menu Password is disabled. You do not need the password to disable the Menu Password.

LCD Parms Menu

Use the LCD Parms menu (option 2 on the Main Menu) to configure liquid crystal display parameters for the terminal:

	LCD Parms
1)	
2)	
3)	Screen Mode
4)	Annunciators
5)	
6)	
7)	Scroll Window
I	

Screen Mode

The terminal has several screen modes that present a window/viewport onto the IBM terminal's 80x24 display buffer. Screen modes govern which portion of the larger IBM terminal's screen the terminal initially presents, and how the window/viewport moves as the cursor moves.

Modes are as follows:

Screen Mode Center Cursor Corner Mode Page Mode Lazy Mode Locked Mode

Center Cursor Mode

Center mode works best for applications that use the entire data stream's 80x24 logical display. In this mode, the cursor remains in the center of the terminal's window. As the cursor moves within the window, the terminal's display window moves to keep it centered. When the cursor moves off the right, left, top, or bottom edge of the IBM display station, the window remains fixed despite the cursor's movement.

Corner Mode

Corner mode is the default mode. It begins with the window in the upper left corner of the larger IBM display station. It keeps the cursor in the lower right corner of the display. Corner mode works best for applications that use the upper left corner of the logical screen. As the cursor moves off the right or bottom edge of the terminal's display, the window moves to show the cursor. You can move the cursor a predetermined number of key presses in all four directions.

Page Mode

Page mode provides predefined pages within the larger IBM display station. The size of these pages depends on the number of rows and columns selected for display. The terminal moves the window by a multiple of the page size. As the cursor moves off the edge of the terminal's display, the window changes to the

Note that some "pages" in page mode overlap each other; the same information is shown on both pages. This overlap occurs because the 24-row by 80-column CRT screen cannot be divided equally.

Lazy Mode

In lazy mode, the window does not move in respect to the 80x24 screen as long as the cursor stays inside the current display window (similar to page mode). When the cursor moves outside of the display window in lazy mode, however, the window moves as little as possible until the cursor is back inside the window.

Locked Mode

In Locked mode, the view window locks to the upper left-hand corner of the display. The screen does not window around, and only the area that has been selected to be the screen size is visible. Locked mode disables the windowing keys, or only allows you to window around the physical display size set in the configuration menus.

Annunciators

Use the Annunciators option to position the annunciators:

Annunciators Use cursor up and down keys to Adjust.

Press ▲ or ▼ to position the annunciators around each of the four display corners, once as a line and once as a box (default: lower left corner). The position where they disappear is the "stealth" mode. In stealth mode, annunciators appear during normal operation, but disappear when you press a key.

Scroll Window

Use Scroll Window to define the size (tab size or screen size) of the cursor movement, or to customize the screen size:

> Scroll Window 2) Screen Size 3) Define Width

When enabled, menu options do the following:

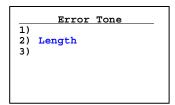
Tab Size Moves the cursor by the amount configured for (Default) Define Width and Define Height. Screen Size Causes the cursor to move by the virtual screen size. Define Width and Define Height Manually defines the x-axis and y-axis (up and (Default for both: 8) down) movement of the cursor when you select Tab Size. The width is 1-80. The height is 1-24.

Beeper Setup Menu

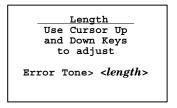
Use the Beeper Setup menu (option 3 on the Main Menu) to configure the error tone:



The error tone option is as follows:



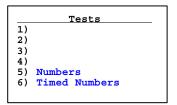
Press [2] to set the length:



The range is 1 through 10, which equates to a 50 to 500 ms beep for all errors. The default is 3 ms.

Tests Menu

Intermec Systems Engineers use the Tests menu (option 4 on the Main Menu) to verify terminal operation during environmental stress tests. Tests are as follows:



Numbers

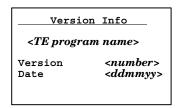
The Numbers test helps detect lockups during severe operating conditions. During the test, the terminal's display is filled with hexadecimal numbers that move across the screen horizontally and scroll vertically. Character movement indicates the processor is still running. To stop the test, press any key.

Timed Numbers

The Timed Numbers test is similar to the Numbers test, but it it also displays the number of seconds the test took. The test terminates when you press a key or when 65,536 numbers have been displayed.

Version Info Option

Use Version Info (option 5 on the Main Menu) to display the following:



For TE program names, see Section 1, "Getting Started."

Exit Menus Option

Use Exit Menus (option 6 on the Main Menu) to exit the TE configuration menus. If you changed any parameter settings, the terminal displays the following message when you exit the menus:

SAVE PARMS?

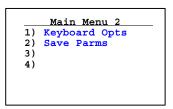
If you press [Y] ("yes"), you are prompted for a password. After you enter the correct password, your settings are saved to Flash, and the terminal may reboot. (Some changes automatically reboot the terminal.) If you press a key other than [Y], you exit the menus and the new settings are NOT saved. In this case, the new settings are lost when you reboot your terminal.

When you exit the TE configuration menus, the following information appears:

<TE program name> <version> Session: <number> Host: <data stream>

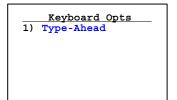
More Option (Main Menu 2)

Use More (option 7 on the Main Menu) to open the Main Menu 2:



Keyboard Opts

Use Keyboard Opts to set the type-ahead feature:



Type-ahead lets you enter information when the terminal cannot immediately send data to the host. Type-ahead stores keystrokes after the Input Inhibited annunciator (below) appears on the status line, and then saves them for the next input field.



Input Inhibited annunciator

Type-ahead is enabled by default.

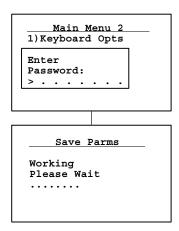
Save Parms

Use Save Parms to retain the changes you made to TE configuration settings. When you save the changes, they become the default settings for the terminal.

NOTE:

Use this option sparingly. Each time you use it, additional memory space is occupied because previously saved changes are not erased. The memory cannot be recovered.

Ensure the parameters are correct before you choose Save Parms. When you select Save Parms, you are prompted to enter a seven-character password:



The password is **CR52401**. After you enter the correct password, your changes are written to Flash.

Restarting Terminal Emulation

You need to restart your TE application if you are having problems or if you want to reconnect to the host with a new configuration. Restarting your TE application also clears the auto-login information, preventing another user from establishing a TE session using your login information.

You can restart your TE application by either scanning Reset Firmware or by using the Exit Menus option in the TE configuration menus (option 6 on the Main Menu). Both methods reset all terminal firmware and the application and run the application in a new session.

To restart TE:

Scan this bar code label:

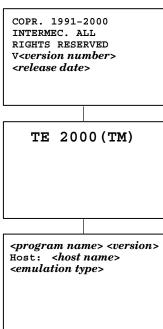
Reset Firmware



The terminal restarts your TE application using the configuration saved in CONFIG.DAT.

Or follow this procedure:

1. At the third initialization screen (below) or anywhere in a TE session, access the Main Menu by pressing the appropriate key combination (see page 4-2).



NOTE:

If you are not connected to the DCS 300 or host, or have problems accessing the Main Menu, reset your terminal to go to the initialization screens.

The Main Menu appears:

Main Menu 1) Set-up Parms 2) LCD Parms Beeper Setup 4) Tests 5) Version Info 6) Exit Menus 7) More

- Select Exit Menus.
 - The Exit Menus option quits the TE configuration menus and returns the terminal to the initialization screens. The terminal restarts your TE application using the configuration saved in CONFIG.DAT.
- 3. Start using the application or change the TE configuration.

Section 5

Customizing Your Configuration

This section describes the procedures you can use to customize the standard VT/ANSI TE program by Intermec[®]. You customize the TE program by creating or modifying configuration files, and then downloading them to your terminal to do the following:

- ▶ Use the auto-login feature to send the same login information each time you login to the host. *Page 5-1*
- ▶ Display double-byte characters. *Page 5-9*
- ▶ Create a custom parameter set-up file to download a customized file to all terminals so they have the same setup information. *Page 5-9*
- ▶ Change the text of TE configuration menus or system messages. *Page 5-34*
- ▶ Preinitialize the VT/ANSI TE program. *Page 5-35*
- ▶ Remap the terminal's keys. *Page 5-35*
- ▶ Remap characters. *Page 5-43*

Using the Auto-Login Feature

Use the auto-login feature to send the same login information each time you login to the host. When you start the TE application, the terminal checks for an auto-login script file. If a script file exists, the terminal runs the login commands from the auto-login script file before the TE program starts.

To use the auto-login feature, you need to:

- ▶ Develop an auto-login script file.
- ▶ Load the auto-login script file on the terminal.

These steps are covered on the following pages along with a list of the necessary control characters and the procedure for disabling the auto-login feature.

Developing Auto-Login Script Files

A typical auto-login script file consists of Input and InputHidden commands followed by a HostName command, followed by a series of WaitFor and Send commands. A very simple script file may not have any input commands if all of the terminals are using the same account.

Commands

You can use several commands to create auto-login script files. All commands are case-sensitive. For example, WaitFor is a command, but Waitfor is not a valid command. For examples of script files, see "Sample Auto-Login Script Files" later in this section.

The following chart describes the commands.

Command	Description	
Input	Input is called with two parameters. The first one is a character string enclosed in quotes that is used as a prompt to the user. The second one is a string variable name indicating where the text string will be stored.	
InputHidden	Same as the Input script command except that user input is echoed as a string of asterisks.	
HostName	HostName is followed by a character string enclosed in quotes. The character string can be a host name or an asterisk. The host name command acts as an IF clause. If the host name matches, the following section of the script file is executed up to the next host name command. If an asterisk is used, it matches any host name.	
WaitFor	Wait for a list of up to 10 strings. The strings must be enclosed in quotes and must be separated by a comma. The strings cannot exceed 20 characters in length.	
Send	This command sends a character string enclosed in quotes or a string variable to the host. The character string enclosed in quotes can have an embedded control key in VT/ANSI TE.	
Pause "xxxxx"	Delays the terminal for x milliseconds.	
PromptSessionStart	This command is a predefined variable. If this variable is defined and set to any value other than 0, the application prompts the user to press [Enter] before starting a Telnet session with the host. Do not put quotes around the variable.	
Restart "x"	Restarts the autologin script file. The "x" is a dummy argument.	
Keyboard "0"	Disables the keyboard. Key presses are ignored. For additional information, see Note below.	
Keyboard "1"	Enables the keyboard. Key presses are processed. The keyboard is enabled by default. For additional information, see Note below.	



The Keyboard "0" or Keyboard "1" command must be input into the autologin script file after the PromptSessionStart command (if present) and the HostName command (if present). The keyboard command must also be turned on before another HostName command is found in the file.

Search Strings

Some auto-login search string limitations are as follows:

- ▶ All blank areas on the display are seen as space characters by auto-login in VT emulation.
- ▶ The searches are case sensitive.
- ▶ The maximum search string length is 20 characters.
- ▶ Each WaitFor command searches the entire screen from the top.

You can use line wrapping to look for unique strings.

If a screen from the host has multiples of the word you are looking for, you can use the preceding spaces to identify a unique string.

EXAMPLE:

If the screen sent to the terminal is:

Linux rlogin 2.4.6 login

The autologin script would be:

PromptSessionStart=1

HostName "*"

#wait for host login screen and send login and password

WaitFor "login"

Send "billy<ENTER>"

WaitFor "password"

Send "letmein<ENTER>"

In this example, you can search for the three leading spaces from the end of the previous line to make a unique search string.

Control Characters

You can include control characters in your auto-login script file. The control character must be enclosed by < > (angle brackets) in AUTOLOG.SCR. Table 5-1 lists control characters for VT/ANSI TE.

NOTE:

You can also use the corresponding hexadecimal value to represent the control character. For a description of control characters and hexadecimal equivalents, see the full ASCII chart in Appendix B.

Table 5-1 Control Characters for Auto-Login Script File

Control Character	Definition .
<ack></ack>	Acknowledgment
<bel></bel>	Bell
<bs></bs>	Backspace
<can></can>	Cancel
<cr></cr>	Carriage Return
<cur_dn></cur_dn>	Cursor Down
$<$ CUR_LF $>$	Cursor Left
$<$ CUR_RT $>$	Cursor Right
<cur_up></cur_up>	Cursor Up
<dc1></dc1>	Device Control 1 (XON)
<dc2></dc2>	Device Control 2
<dc3></dc3>	Device Control 3 (XOFF)
<dc4></dc4>	Device Control
	Delete
<dle></dle>	Data Link Escape
	End of Medium
<enq></enq>	Enquiry
<enter></enter>	Enter
<eot></eot>	End of Transmission
<esc></esc>	Escape
<etb></etb>	End Transmission Block
<etx></etx>	End of Text
<f1> - <f20></f20></f1>	Function keys
<f21></f21>	Toggles from Character mode/Line Edit (block) mode
<ff></ff>	Form Feed
<fs></fs>	File Separator
<gs></gs>	Group Separator
<ht></ht>	Horizontal Tab
<ins></ins>	Insert
<lf></lf>	Line Feed
<ltab></ltab>	Left Tab
<nak></nak>	Negative Acknowledge
<nul></nul>	Null, or all zeroes
<rs></rs>	Record Separator
<rtab></rtab>	Right Tab
<si></si>	Shift In
<so></so>	Shift Out
<soh></soh>	Start of Heading
<space></space>	Space
<stx></stx>	Start of Text
	Substitute
<syn></syn>	Synchronous Idle
<us></us>	Unit Separator
<vt></vt>	Vertical Tab

Loading the Auto-Login Script File

Follow these procedures to download an auto-login script file to your terminal. The method depends on the type of terminal you are using.

2415, 2425, 2455, or 248X Terminal

You can download more than one script file to a 2415, 2425, 2455, or 248X terminal, but name the file you want to use immediately as AUTOLOG.SCR and name any other script files with different names ending with .SCR. To learn more about transferring files, refer to your terminal's user manual.

To use the serial port to download the file:

- 1. Create your auto-login script file using any text editor. Or, copy and modify one of the sample script files later in this section.
- 2. Save the file you create as AUTOLOG.SCR.
- 3. Connect the terminal to the development personal computer or host. For help, refer to your terminal's user manual or your accessory documentation.
- 4. Download the AUTOLOG.SCR file to the terminal. You must load the AUTOLOG.SCR file into drive C, where the TE application is stored. For help, refer to your terminal's user manual.

To use RF communications to download the file:

- 1. Create your auto-login script file using any text editor, or copy and modify one of the sample script files later in this section.
- 2. Save the file you create as AUTOLOG.SCR.
- 3. Copy the AUTOLOG.SCR file to the DCS 300 in a UDP Plus network, or copy the AUTOLOG.SCR file to a host in a TCP/IP direct connect network.
- 4. Use the Download Server option on the DCS 300 to download the file to the
 - Or, use your TFTP application on the host to download the file to the terminal.

When you reset your terminal, it clears the auto-login information, such as the password and user's name. You can cancel the auto-login process by pressing any key during the auto-login sequence. When a host session is broken, you can restart the auto-login sequence by rebooting your terminal.

6400 or 5055 Computer

- 1. Using any text editor, create the auto-login script file on a personal computer. Or, copy and modify one of the sample script files later in this section.
- 2. Save the file you create as AUTOLOG.SCR.
- 3. Use INTERLNK/INTERSVR communications to connect your terminal to a personal computer. For help, see "Downloading Files" later in this section. You must load AUTOLOG.SCR into drive C, where the TE application is stored.

Disabling the Auto-Login Feature

To disable auto-login, you must rename the AUTOLOG.SCR file. Renaming AUTOLOG.SCR forces your TE application to use the default login. Renaming also ensures that you can use the same auto-login script file later by changing the name back to AUTOLOG.SCR. If you want to enable a new script file, you can use the instructions in this section to rename a different script file to AUTOLOG.SCR.

Follow these procedures to disable (or delete) the auto-login script file. The method depends on the type of terminal you are using.

2415, 2425, 2455, or 248X Terminal

1. Press the appropriate key sequence or scan the following bar code to access the TRAKKER Antares[®] 2400 Menu System:

Enter Test and Service Mode



The Main Menu appears.

- 2. Choose System Menu and then choose File Manager.
- 3. Select drive C.
- 4. Press \blacktriangle or \blacktriangledown to highlight AUTOLOG.SCR and press the [F7] key.
- 5. Type a new name for the auto-login script file and press [Enter] or choose OK.
- 6. Exit the TRAKKER Antares 2400 Menu System to return to your current TE session. Restart your TE application to use TE without the auto-login feature.

You can also rename the auto-login script file from your host. For help, refer to your terminal's user manual.

6400 or 5055 Computer

- 1. Exit your TE application.
- 2. Use INTERLNK/INTERSVR communications to connect your terminal to a personal computer. For help, see "Downloading Files" later in this section.
- 3. Go to the 6400 or 5055 computer's DOS prompt.
- 4. Rename AUTOLOG.SCR.

Sample Auto-Login Script Files

You can use these sample script files as they are or as the starting point for creating your own auto-login script files.

EXAMPLE 1: Auto-Login With All Terminals Using the Same Account

```
PromptSessionStart=1
                         #Ask user to press <Enter> to start auto-login
HostName "*"
                            #Use this to log into any host
Keyboard "0"
                            #Disable the keyboard
WaitFor "login:"
                            #Wait for the login prompt
Send "user name<CR>"
                            #Send the user name
WaitFor "Password:"
                            #Wait for the password prompt
Send "users_password<CR>"
                            #Send the users password
Pause "1000"
                            #Pause 1 second
Keyboard "1"
                            #Enable the keyboard
Restart "1"
                            #Restart the auto-login script file
```

In Example 1:

- The Hostname command matches the host the user accesses.
- ► The # symbol starts a comment that continues to the end of the line.
- The WaitFor command waits for a string to be displayed by the host. WaitFor takes up to 10 strings, 20 characters long. The strings must be enclosed in quotes and separated by a comma.
- The first Send command sends a fixed user name. The second Send command sends a fixed password.
- Angle brackets < and > can enclose uppercase mnemonics or hexadecimal values.

EXAMPLE 2: Auto-Login With Different User Names and Passwords

```
Input "Enter user name", username
                                        #Prompt for user name
InputHidden "Enter password", password #Prompt for password
HostName "*"
WaitFor "login:"
                                 #Wait for the login prompt
Send user name
                                 #Send the user name
                                 #Send a carriage return
Send "<CR>"
WaitFor "Password:"
                                 #Wait for the password prompt
Send password
                                 #Send the users password
Send "<CR>"
                                 #Send a carriage return
```

In Example 2:

- The Input and Send commands use input variables. Input commands require a prompt string followed by a comma and a variable name to store the string in.
- ▶ The InputHidden command will display "*" in place of any characters the user types. All input commands must be before the first HostName command.
- The Send command only accepts a single argument, so you need two Send commands to send the user name and a carriage return.

EXAMPLE 3: Auto-Login to an Application

prompt for user name Input "Enter user name", username InputHidden "Enter Password", password #Prompt for password HostName "*" WaitFor "login:" #Wait for the login prompt Send username #Send the user name WaitFor "<CR>" #Send a carriage return WaitFor "Password:" #Wait for password prompt Send password #Send the users password Send "<CR>" #Send a carriage return WaitFor "Main Menu" #Wait for the main menu Send "3" Send "<CR>" #Pick option 3 from the menu WaitFor "Wip Menu" #Wait for work in process menu Send "1" Send "<CR>" #Pick option 1 from the menu

Example 3 modifies the script file in Example 2. The additional modification (which starts with WaitFor "Main Menu") allows you to move automatically to an application after logging in.

EXAMPLE 4: Auto-Login With Variable Processing

```
Input "Enter user name", username
                                        # Prompt for user name
InputHidden "Enter Password", password #Prompt for password
                    #Use this portion of script for BigHost
HostName "BiqHost"
WaitFor "User:"
                               #Wait for the user prompt
Send username
                               #Send the user name
Send "<CR>"
                               #Send a carriage return
WaitFor "Password:"
                               #Wait for the password prompt
Send password
                               #Send the users password
Send "<CR>"
                               #Send a carriage return
HostName "*"
                               #Match any other host name
WaitFor "login:"
                               #Wait for the login prompt
Send username
                               #Send the user name
WaitFor "<CR>"
                               #Send a carriage return
WaitFor "Password:"
                               #Wait for password prompt
Send password
                               #Send the users password
Send "<CR>"
                               #Send a carriage return
WaitFor "Main Menu"
                               #Wait for the main menu
Send "3"
                               #Pick option 3 from the menu
Send "<CR>"
WaitFor "Wip Menu"
                               #Wait for work in process menu
Send "1"
Send "<CR>"
                               #Pick option 1 from the menu
```

Here, a section for the host name BigHost is added to the beginning of the script file. If you log into any host other than BigHost, the script file starts at the HostName "*" line. This allows for different processing on each host.

Auto-Login Restart

The Auto-Login Restart command starts the auto-login script file from the correct host name statement in the script file when a host session is broken. For this command to work, the WaitFor string must match the last data sent from the host. For example, if the WaitFor string is the login prompt "login:" with a space after the colon, the WaitFor string must include a space for the auto-login restart to work.

To use the Auto-Login Restart command, press the keys listed in Section 3, "Using the Terminal's Keyboard." Or, scan the bar code in Appendix A.

Displaying Double-Byte Characters

The 2415 terminal supports Double-Byte Character Sets. The sets available are Big 5 Chinese, Simplified Chinese, Japanese (Kanji), and Korean (Hangul).

The Double-Byte Character Set is preloaded on the 2415 terminal. To order a Double-Byte Character Set, contact your Intermec Sales Representative. If you order a set, follow the instructions in the terminal's user manual to install it.

To configure the terminal for the character set, set the terminal's screen size to 8x16.

Creating a Custom Parameter Set-Up File

You can create a custom VT/ANSI TE set-up file to preset almost any parameter you can set from the TE configuration menus. These parameter settings become the default (cold start) configuration for the terminal.

Syntax

The parameter set-up file is an ASCII text file that contains one item per line. To get the utility, contact your Systems Engineer.

You can name the input file as you choose. When you use the CHECKCFG utility later to verify the file, you must change the output file name to CONFIG.DAT.

The syntax of a line is:

FieldName = Value;

Qualifier.FieldName = Value;

- ▶ FieldName is the name of the parameter you want to modify.
- ▶ Value is the new value for the field.
- ▶ Qualifier and FieldName must be ASCII strings that match one of the configuration parameters.
- ▶ Value can be an ASCII string or a numeric value, depending on the type of the parameter FieldName specifies. The parameters along with their types and allowable values are listed under "Parameters and Qualifiers" later in this section.

A field may have zero or more qualifiers.

The set-up files ignores the following:

- ▶ Blank lines
- ► Leading white space (spaces and tabs)
- ▶ White space on either side of any delimiter (a period, an equal sign, or a

In addition, the set-up file converts consecutive white space characters within strings to one space. For example, this line:

```
Screen
           Mode
                            Page Mode
is the same as:
Screen Mode=Page Mode;
```

You can set the Value field of any configuration parameter to "?", which indicates that the TE configuration program should prompt the user for the appropriate value. For example, this parameter causes the terminal to prompt the user to select a screen mode from the list of values:

```
Screen Mode = ?;
```

Following is a sample set-up file.

```
Program Name = CUSTOM;
Screen Mode = Page Mode;
Host A.Port Number = 1;
Data Stream = VT220;
Code 39.Encoded = Enabled;
Extended Cmds = Enabled:
```

Parameter Formats

Each parameter in the set-up file is followed by one of three different formats that indicates the type of parameter and the values it can contain. Formats are as follows:

▶ **Literal strings.** For example:

```
[Session 1].Screen Mode
Session 2.Screen Mode
  Center Cursor
  Corner Mode
  Page Mode
  Lazy Mode
  Locked Mode
```

Screen Mode may be qualified by Session 1 or 2. It may take the value Center Cursor, Corner Mode, Page Mode, Lazy Mode, or Locked Mode. Session 1 is the default qualifier. These configuration lines are valid:

```
Screen Mode = Lazy Mode;
Session 1.Screen Mode = Lazy Mode;
Session 2.Screen Mode = Lazy Mode;
```

- **Numeric parameters.** Numeric parameters have minimum and maximum values. Parameters can be either decimal or hexadecimal:
 - ▶ Decimal parameters consist of digits 0 through 9.
 - ▶ Hexadecimal parameters consist of 0x or 0X, followed by 1 to 4 digits of 0 through 9, a through f, or A through F. These are equivalent: 160, 0xA0, and 0Xa0.

For example:

```
[Session 1].[Host A].Port Number
Session 2.Host A.Port Number
[Session 1].Host B.Port Number
Session 2.Host B.Port Number
[Session 1].Host C.Port Number
Session 2.Host C.Port Number
  Numeric, minimum = 0, maximum = 65535
```

Port Number is a variable with a minimum value of 0 and a maximum of 65535. These lines are valid:

```
Port Number = 1;
Session 1. Host A. Port Number = 1;
Session 2. Host A. Port Number = 1;
```

▶ String parameters. String parameters are variables with minimum and maximum lengths. For example:

```
Program Name
```

```
String, minimum length = 8, maximum length = 8
```

Program Name is unqualified. It must have eight characters. These configuration lines are valid:

```
Program Name = ABCDEFGH;
Program Name = FWP248H0;
```

Verifying Your Configuration

Use the CHECKCFG utility to verify that you properly configured your set-up file. CHECKCFG reads your configuration and reports any syntax errors. To get the utility, contact your Systems Engineer.

To verify your configuration:

Type:

checkcfg <input config file> cfglit.dat config.dat

- <input config file> is the name of your parameter set-up file.
- ▶ CFGLIT.DAT contains the strings that appear in the configuration menus, parameter files, and system messages.
- ► CONFIG.DAT is the name of the output file you will download to the terminal. This file must be named CONFIG.DAT.

You are ready to download CONFIG.DAT to the terminal when CHECKCFG reports no errors. For download instructions, see "Downloading Files" later in this section.

If CHECKCFG reports an error, use a text editor to open your set-up file and correct it. The following chart lists the system messages CHECKCFG may display.

Default String	Description	ID Number
Can't open file	CONFIG.DAT could not be located.	F000
Bad option name	The right side of an expression in CONFIG.DAT is an invalid name.	F001
Syntax error	CONFIG.DAT contains a syntax error.	F002
Bad string length	The right side of an expression in CONFIG.DAT is a string that is too long for the specified parameter.	F003
Unknown type	The parameter table in the configuration program contains a bad value. This error is for testing purposes only and should never occur.	F004
Value out of range	The right side of an expression in CONFIG.DAT is a number that is out of range for the specified parameter.	F005
Bad value	The right side of an expression in CONFIG.DAT is a string that is invalid for the specified parameter.	F006
Expected numeric	The right side of an expression in CONFIG.DAT should be a numeric value but contains nonnumeric data.	F007
Missing '='	A line in CONFIG.DAT does not contain the required "=" (equal sign).	F008
Missing '; '	A line in CONFIG.DAT is not terminated by a ";" (semicolon).	F009

Parameters and Qualifiers

Parameters in the set-up file apply to all model numbers unless otherwise noted here. The following pages list each parameter and its qualifiers. Some qualifiers have default values. If you want to use the default value, you can omit the qualifier from the parameter set-up file. Default qualifiers are listed between square brackets "[]" in this section.

The CFGLIT.DAT file specifies the text of set-up menus or system messages. Parameters and qualifier strings in the set-up file assume you are using the default CFGLIT.DAT file. To customize CFGLIT.DAT, see "Changing Text" later in this section.

NOTE:

Only WTP terminals support dual sessions ("Session 2"). For a list of terminals with WTP, see "Program Names" in Section 1.

Set-Up Parameters Options

```
► Channel (900 MHz radio)
  [Session 1].[Host A].Channel
  Session 2.Host A.Channel
  [Session 1].Host B.Channel
  Session 2.Host B.Channel
  [Session 1].Host C.Channel
  Session 2. Host C. Channel
     10
     25
     30
     25
     30
     35
```

▶ Data Stream

40

```
[Session 1].[Host A].Data Stream
Session 2.Host A.Data Stream
[Session 1].Host B.Data Stream
Session 2.Host B.Data Stream
[Session 1].Host C.Data Stream
Session 2.Host C.Data Stream
  [Native] 6400 and 5055 computers with WTP
  [3270] 2415, 2425, 2455, and 248X terminals; and 6400 and 5055
         computers with IP
  5250
  VT220
```

► Frequency (S-UHF radio)

[Session 1].[Host A].Frequency Session 2. Host A. Frequency [Session 1]. Host B. Frequency Session 2. Host B. Frequency [Session 1].Host C.Frequency Session 2. Host C. Frequency Numeric, minimum=0, maximum=0

▶ **Host Name** (6400 and 5055 computers)

```
[Session 1].[Host A].Host
Session 2.Host A.Host
[Session 1].Host B.Host
Session 2.Host B.Host
[Session 1].Host C.Host
[Session 1].Host C.Host
  String, minimum length = 0, maximum length = 16 [null string]
```

▶ Lan ID

```
[Session 1].[Host A].Lan
Session 2.Host A.Lan
[Session 1].Host B.Lan
Session 2.Host B.Lan
[Session 1].Host C.Lan
Session 2.Host C.Lan
  Numeric, minimum = 0, maximum = 254 [0] applies to 900 MHz
  Numeric, minimum = 0, maximum = 15 [0] applies to 2.4 GHz OpenAir
```

► Mode

[Session 1].[Host A].Mode
Session 2.Host A.Mode
[Session 1].Host B.Mode
Session 2.Host B.Mode
[Session 1].Host C.Mode
[Session 2.Host C.Mode
Session 2.Host C.Mode
For 900 MHz radio:
DS 225K
DS 090K
DS 450K
For S-UHF radio:
Freq Agility
Single Freq

▶ Port Number

[Session 1].[Host A].Port Number
Session 2.Host A.Port Number
[Session 1].Host B.Port Number
Session 2.Host B.Port Number
[Session 1].Host C.Port Number
Session 2.Host C.Port Number
Numeric, minimum = 0, maximum = 65535 [0]

▶ Radio Configuration Number

[Session 1].[Host A].Radio Config#
Session 2.Host A.Radio Config#
[Session 1].Host B.Radio Config#
Session 2.Host B.Radio Config#
[Session 1].Host C.Radio Config#
Session 2.Host C.Radio Config#
Numeric, minimum = 0, maximum = 255 [0]

▶ Radio Number (same as unit number)

[Session 1].[Host A].Radio #
Session 2.Host A.Radio #
[Session 1].Host B.Radio #
Session 2.Host B.Radio #
[Session 1].Host C.Radio #
Session 2.Host C.Radio #
Numeric, minimum = 0, maximum = 127 [127]

▶ Server IP

[Session 1].[Host A].Server IP
Session 2.Host A.Server IP
[Session 1].Host B.Server IP
Session 2.Host B.Server IP
[Session 1].Host C.Server IP
Session 2.Host C.Server IP
Numeric, minimum = 1, maximum = 16

► SNA

[Session 1].SNA Session 2.SNA Enabled [Disabled]

▶ Telnet

[Session 1].Telnet Session 2.Telnet [Enabled] 2415, 2425, 2455, and 248X terminals; and 6400 and 5055 computers with IP [Disabled] 6400 and 5055 computers with WTP

▶ Terminal Type

[Session 1].[Host A].Terminal Type Session 2. Host A. Terminal Type [Session 1].Host B.Terminal Type Session 2. Host B. Terminal Type [Session 1].Host C.Terminal Type Session 2.Host C.Terminal Type Numeric, minimum = 0, maximum = 255

▶ **Unit Number** (same as radio number)

[Session 1].[Host A].Unit # Session 2.Host A.Unit # [Session 1].Host B.Unit # Session 2.Host B.Unit # [Session 1].Host C.Unit # Session 2.Host C.Unit # Numeric, minimum = 0, maximum = 127 [127]

Bar Code Parameters

NOTE:

Bar code parameters apply to 6400 and 5055 computers unless otherwise noted. The only parameter that 2415, 2425, 2455, and 248X terminals support is "Code 39. Encoded."

▶ BC Type Character (not supported on the 5055 computer)

[Session 1].BC Type Char Session 2.BC Type Char Enabled [Disabled]

▶ Concatenate

[Session 1].Concatenate Session 2]. Concatenate Enabled [Disabled]

MOD 10 Check

[Session 1].MOD 10 Check Session 2.MOD 10 Check Enabled [Disabled]

▶ **Redundancy** (not supported on the 5055 computer)

[Session 1].Redundancy Session 2. Redundancy Enabled [Disabled]

▶ Scan All Fields

[Session 1].Scan All Flds Session 2.Scan All Flds Enabled [Disabled]

▶ Scan Postamble Character

[Session 1].Scan PostChar Session 2.Scan PostChar Numeric, minimum = 0, maximum = 255 [space]

▶ Scan Preamble Character

[Session 1].Scan PreChar Session 2.Scan PreChar Numeric, minimum = 0, maximum = 255 [space]

▶ **Scan Timeout** (not supported on the 6400 and 5055 computers)

[Session 1].Scan Timeout Session 2.Scan Timeout Numeric, minimum = 1, maximum = 200 [30]

▶ **Scanner Type** (6400 and 5055 computers support Laser only)

[Session 1].Scanner Type Session 2.Scanner Type [No Scanner] Wand Laser Wand Emulate Auto Detect

▶ Stream Scan

[Session 1].Stream Scan Session 2.Stream Scan Enabled [Disabled]

Bar Code Symbologies

▶ ABC Codabar

[Session 1].ABC Codabar Session 2.ABC Codabar Enabled [Disabled]

▶ Codabar

[Session 1].Codabar Session 2.Codabar Enabled [Disabled]

▶ Code 11 (not supported on the 6400 and 5055 computers)

[Session 1].Code 11 Session 2.Code 11 Enabled [Disabled]

▶ Code 93

[Session 1].Code 93 Session 2.Code 93 Enabled [Disabled]

▶ Code 39

[Session 1].Code 39 Session 2.Code 39 Enabled [Disabled]

▶ Code 128

[Session 1].Code 128 Session 2.Code 128 Enabled [Disabled]

► Computer Identics 2 of 5

[Session 1].CI 2of5 Session 2.CI 2of5 Enabled [Disabled]

► EAN

[Session 1].EAN Session 2.EAN Enabled [Disabled]

▶ Interleaved 2 of 5

[Session 1].Int 2of5 Session 2.Int 2of5 Enabled [Disabled]

▶ Plessey (6400 computer does not support Plessey alpha characters)

[Session 1].Plessey Session 2.Plessey Enabled [Disabled]

▶ Straight 2 of 5

[Session 1].Str 2of5 Session 2.Str 2of5 Enabled [Disabled]

▶ UPC

[Session 1].UPC Session 2.UPC Enabled [Disabled]

Generic Bar Code Options

NOTE:

Generic bar code options must be qualified by one of the bar code symbology strings. For example: "Session 1.UPC.Max Length = 13;"

Drop Leading

[Session 1].UPC.Drop Leading Session 2.UPC.Drop Leading [Session 1].EAN.Drop Leading Session 2.EAN.Drop Leading [Session 1].Code 128.Drop Leading Session 2.Code 128.Drop Leading [Session 1].Code 39.Drop Leading Session 2.Code 39.Drop Leading [Session 1].Codabar.Drop Leading Session 2.Codabar.Drop Leading [Session 1].ABC Codabar.Drop Leading Session 2.ABC Codabar.Drop Leading [Session 1].Str 2of5.Drop Leading Session 2.Str 2of5.Drop Leading [Session 1].Int 2of5.Drop Leading Session 2.Int 2of5.Drop Leading [Session 1].CI 2of5.Drop Leading Session 2.CI 2of5.Drop Leading [Session 1].Code 11.Drop Leading Session 2.Code 11.Drop Leading [Session 1].Code 93.Drop Leading Session 2.Code 93.Drop Leading [Session 1].Plessey.Drop Leading Session 2.Plessey.Drop Leading Numeric, minimum = 0 [0], maximum = 15 [0]

▶ Drop Trailing

[Session 1].UPC.Drop Trailing Session 2.UPC.Drop Trailing [Session 1].EAN.Drop Trailing Session 2.EAN.Drop Trailing [Session 1].Code 128.Drop Trailing Session 2.Code 128.Drop Trailing [Session 1].Code 39.Drop Trailing Session 2.Code 39.Drop Trailing [Session 1].Codabar.Drop Trailing Session 2.Codabar.Drop Trailing [Session 1].ABC Codabar.Drop Trailing Session 2.ABC Codabar.Drop Trailing [Session 1].Str 2of5.Drop Trailing Session 2.Str 2of5.Drop Trailing [Session 1].Int 2of5.Drop Trailing Session 2.Int 2of5.Drop Trailing [Session 1].CI 2of5.Drop Trailing Session 2.CI 2of5.Drop Trailing [Session 1].Code 11.Drop Trailing Session 2.Code 11.Drop Trailing [Session 1].Code 93.Drop Trailing Session 2.Code 93.Drop Trailing [Session 1]. Plessey. Drop Trailing Session 2.Plessey.Drop Trailing Numeric, minimum = 0[0], maximum = 15[0]

▶ Fix Length 1

[Session 1].UPC.Fix Length 1 Session 2.UPC.Fix Length 1 [Session 1].EAN.Fix Length 1 Session 2.EAN.Fix Length 1 [Session 1].Code 128.Fix Length 1 Session 2.Code 128.Fix Length 1 [Session 1].Code 39.Fix Length 1 Session 2.Code 39.Fix Length 1 [Session 1].Codabar.Fix Length 1 Session 2.Codabar.Fix Length 1 [Session 1].ABC Codabar.Fix Length 1 Session 2.ABC Codabar. Fix Length 1 [Session 1].Str 2of5.Fix Length 1 Session 2.Str 2of5.Fix Length 1 [Session 1].Int 2of5.Fix Length 1 Session 2.Int 2of5.Fix Length 1 [Session 1].CI 2of5.Fix Length 1 Session 2.CI 2of5.Fix Length 1 [Session 1].Code 11.Fix Length 1 Session 2.Code 11.Fix Length 1 [Session 1].Code 93.Fix Length 1 Session 2.Code 93.Fix Length 1 [Session 1].Plessev.Fix Length 1 Session 2.Plessey.Fix Length 1 Numeric, minimum = 0 [0], maximum = 99 [0]

► Fixed Length 2

[Session 1].UPC.Fix Length 2 Session 2.UPC.Fix Length 2 [Session 1].EAN.Fix Length 2 Session 2.EAN.Fix Length 2 [Session 1].Code 128.Fix Length 2 Session 2.Code 128.Fix Length 2 [Session 1].Code 39.Fix Length 2 Session 2.Code 39.Fix Length 2 [Session 1].Codabar.Fix Length 2 Session 2.Codabar.Fix Length 2 [Session 1].ABC Codabar.Fix Length 2 Session 2.ABC Codabar.Fix Length 2 [Session 1].Str 2of5.Fix Length 2 Session 2.Str 2of5.Fix Length 2 [Session 1].Int 2of5.Fix Length 2 Session 2.Int 2of5.Fix Length 2 [Session 1].CI 2of5.Fix Length 2 Session 2.CI 2of5.Fix Length 2 [Session 1].Code 11.Fix Length 2 Session 2.Code 11.Fix Length 2 [Session 1].Code 93.Fix Length 2 Session 2.Code 93.Fix Length 2 [Session 1].Plessey.Fix Length 2 Session 2.Plessey.Fix Length 2 Numeric, minimum = 0[0], maximum = 99[0]

▶ Fixed Length 3

[Session 1].UPC.Fix Length 3 Session 2.UPC.Fix Length 3 [Session 1].EAN.Fix Length 3 Session 2.EAN.Fix Length 3 [Session 1].Code 128.Fix Length 3 Session 2.Code 128.Fix Length 3 [Session 1].Code 39.Fix Length 3 Session 2.Code 39.Fix Length 3 [Session 1].Codabar.Fix Length 3 Session 2.Codabar.Fix Length 3 [Session 1].ABC Codabar.Fix Length 3 Session 2.ABC Codabar. Fix Length 3 [Session 1].Str 2of5.Fix Length 3 Session 2.Str 2of5.Fix Length 3 [Session 1].Int 2of5.Fix Length 3 Session 2.Int 2of5.Fix Length 3 [Session 1].CI 2of5.Fix Length 3 Session 2.CI 2of5.Fix Length 3 [Session 1].Code 11.Fix Length 3 Session 2.Code 11.Fix Length 3 [Session 1].Code 93.Fix Length 3 Session 2.Code 93.Fix Length 3 [Session 1].Plessev.Fix Length 3 Session 2.Plessey.Fix Length 3 Numeric, minimum = 0 [0], maximum = 99 [0]

► Fixed Length 4

[Session 1].UPC.Fix Length 4 Session 2.UPC.Fix Length 4 [Session 1].EAN.Fix Length 4 Session 2.EAN.Fix Length 4 [Session 1].Code 128.Fix Length 4 Session 2.Code 128.Fix Length 4 [Session 1].Code 39.Fix Length 4 Session 2.Code 39.Fix Length 4 [Session 1].Codabar.Fix Length 4 Session 2.Codabar.Fix Length 4 [Session 1].ABC Codabar.Fix Length 4 Session 2.ABC Codabar.Fix Length 4 [Session 1].Str 2of5.Fix Length 4 Session 2.Str 2of5.Fix Length 4 [Session 1].Int 2of5.Fix Length 4 Session 2.Int 2of5.Fix Length 4 [Session 1].CI 2of5.Fix Length 4 Session 2.CI 2of5.Fix Length 4 [Session 1].Code 11.Fix Length 4 Session 2.Code 11.Fix Length 4 [Session 1].Code 93.Fix Length 4 Session 2.Code 93.Fix Length 4 [Session 1]. Plessey. Fix Length 4 Session 2.Plessey.Fix Length 4 Numeric, minimum = 0[0], maximum = 99[0]

Maximum Length

[Session 1].UPC.Max Length Session 2.UPC.Max Length [Session 1].EAN.Max Length Session 2.EAN.Max Length [Session 1].Code 128.Max Length Session 2.Code 128.Max Length [Session 1].Code 39.Max Length Session 2.Code 39.Max Length [Session 1].Codabar.Max Length Session 2.Codabar.Max Length [Session 1].ABC Codabar.Max Length Session 2.ABC Codabar.Max Length [Session 1].Str 2of5.Max Length Session 2.Str 2of5.Max Length [Session 1].Int 2of5.Max Length Session 2.Int 2of5.Max Length [Session 1].CI 2of5.Max Length Session 2.CI 2of5.Max Length [Session 1].Code 11.Max Length Session 2.Code 11.Max Length [Session 1].Code 93.Max Length Session 2.Code 93.Max Length [Session 1].Plessev.Max Length Session 2.Plessey.Max Length Numeric, minimum = 0 [0], maximum = 99 [0]

▶ Minimum Length

[Session 1].UPC.Min Length Session 2.UPC.Min Length [Session 1].EAN.Min Length Session 2.EAN.Min Length [Session 1].Code 128.Min Length Session 2.Code 128.Min Length [Session 1].Code 39.Min Length Session 2.Code 39.Min Length [Session 1].Codabar.Min Length Session 2.Codabar.Min Length [Session 1].ABC Codabar.Min Length Session 2.ABC Codabar.Min Length [Session 1].Str 2of5.Min Length Session 2.Str 2of5.Min Length [Session 1].Int 2of5.Min Length Session 2.Int 2of5.Min Length [Session 1].CI 2of5.Min Length Session 2.CI 2of5.Min Length [Session 1].Code 11.Min Length Session 2.Code 11.Min Length [Session 1].Code 93.Min Length Session 2.Code 93.Min Length [Session 1].Plessey.Min Length Session 2.Plessey.Min Length Numeric, minimum = 0[0], maximum = 99[0]

UPC Options

▶ Add-On 2

[Session 1].UPC.Add-On 2 Session 2.UPC.Add-On 2 Enabled [Disabled]

▶ Add-On 5

[Session 1].UPC.Add-On 5 Session 2.UPC.Add-On 5 Enabled [Disabled]

▶ Expand E to A

[Session 1].UPC.Expand E to A Session 2.UPC.Expand E to A Enabled [Disabled]

▶ System 0 UPCE

[Session 1].UPC.Sys 0 UPCE Session 2.UPC.Sys 0 UPCE Enabled [Disabled]

▶ **System 1 UPCE** (not supported on the 6400 computer)

[Session 1].UPC.Sys 1 UPCE Session 2.UPC.Sys 1 UPCE Enabled [Disabled]

EAN Options

▶ Add-On 2

[Session 1].EAN.Add-On 2 Session 2.EAN.Add-On 2 Enabled [Disabled]

▶ Add-On 5

[Session 1].EAN.Add-On 5 Session 2.EAN.Add-On 5 Enabled [Disabled]

▶ Expand 8 to 13

[Session 1].EAN.Expand 8to13 Session 2.EAN.Expand 8to13 Enabled [Disabled]

Code 39 Options

► Auto-Encoded

[Session 1].Code 39.Auto-Encoded Session 2.Code 39.Auto-Encoded Enabled [Disabled]

▶ Check Digit

[Session 1].Code 39.Chk Digit Session 2.Code 39.Chk Digit Enabled [Disabled]

► Data Decode

[Session 1].Code 39.Data decode Session 2.Code 39.Data decode Enabled [Disabled]

▶ Element Decode

[Session 1].Code 39.Element decod Session 2.Code 39.Element decod Enabled [Disabled]

▶ Encoded

[Session 1].Code 39.Encoded Session 2.Code 39.Encoded Enabled [Disabled]

Extended

[Session 1].Code 39.Extended Session 2.Code 39.Extended Enabled [Disabled]

▶ Full ASCII

[Session 1].Code 39.Full ASCII Session 2.Code 39.Full ASCII Enabled [Disabled]

▶ Quiet Zone

[Session 1].Code 39.Quiet zone Session 2.Code 39.Quiet zone Enabled [Disabled]

► START Decode

[Session 1].Code 39.START decode Session 2.Code 39.START decode Enabled [Disabled]

Interleaved 2 of 5 Option

▶ Interleaved 2 of 5 Chk Digit

[Session 1].Int 2of5.Chk Digit Session 2.Int 2of5.Chk Digit Enabled [Disabled]

Code 11 Options

► **Check Digit 1** (not supported on the 6400 computer)

[Session 1].Code 11.Chk Dig 1 Session 2.Code 11.Chk Dig 1 Enabled [Disabled]

▶ **Check Digit 2** (not supported on the 6400 computer)

[Session 1].Code 11.Chk Dig 2 Session 2.Code 11.Chk Dig 2 Enabled [Disabled]

Plessey Options

▶ Allow Alpha

[Session 1].Plessey.Allow Alpha Session 2.Plessey.Allow Alpha Enabled [Disabled]

▶ MOD 10 Check

[Session 1].Plessey.MOD10 Chk Session 2.Plessey.MOD10 Chk Enabled [Disabled]

▶ MOD 11 Check

[Session 1].Plessey.MOD11 Chk Session 2.Plessey.MOD11 Chk Enabled [Disabled]

Code 128 Options

▶ UCC/EAN

[Session 1].Code 128.UCC/EAN Session 2.Code 128.UCC/EAN Enabled [Disabled]

▶ No UCC Type

[Session 1].Code 128.NO UCC Type Session 2.Code 128.NO UCC Type Enabled Disabled

▶ UCC F1 Value

[Session 1].UPC.UCC F1 Value Session 2.UPC.UCC F1 Value [Session 1].EAN.UCC F1 Value Session 2.EAN.UCC F1 Value [Session 1].Code 128.UCC F1 Value Session 2.Code 128.UCC F1 Value [Session 1].Code 39.UCC F1 Value Session 2.Code 39.UCC F1 Value [Session 1].Codabar.UCC F1 Value Session 2.Codabar.UCC F1 Value [Session 1].ABC Codabar.UCC F1 Value Session 2.ABC Codabar.UCC F1 Value [Session 1].Str 2of5.UCC F1 Value Session 2.Str 2of5.UCC F1 Value [Session 1].Int 2of5.UCC F1 Value Session 2.Int 2of5.UCC F1 Value [Session 1].CI 2of5.UCC F1 Value Session 2.CI 2of5.UCC F1 Value [Session 1].Code 11.UCC F1 Value Session 2.Code 11.UCC F1 Value [Session 1].Code 93.UCC F1 Value Session 2.Code 93.UCC F1 Value [Session 1].Plessey.UCC F1 Value Session 2.Plessey.UCC F1 Value Numeric, minimum = 0 [0], maximum = 255

VT/ANSI Protocol Options

▶ AnswerBack

[Session 1].AnswerBack Session 2.AnswerBack String, minimum length=0, maximum length = 30 [null string, not defined]

▶ Auto Enter Scan

[Session 1].Auto Entr Scn Session 2.Auto Entr Scn Enabled [Disabled]

▶ Auto Tab Scan

[Session 1].Auto Tab Scan Session 2.Auto Tab Scan Enabled [Disabled]

▶ CR to CRLF

[Session 1].CR to CRLF Session 2.CR to CRLF Enabled [Disabled]

DEL to BS

[Session 1].DEL to BS Session 2.DEL to BS Enabled [Disabled]

▶ **Discrete Bells** (6400 and 5055 computers)

[Session 1].DiscreteBells Session 2.DiscreteBells Enabled [Disabled]

▶ Extended Commands

[Session 1].Extended Cmds Session 2.Extended Cmds Enabled [Disabled]

▶ Host View Columns

[Session 1].Host View Cols Session 2.Host View Cols Numeric, minimum = 1, maximum = 255 [24]

► Host View Rows

[Session 1]. Host View Rows Session 2.Host View Rows Numeric, minimum = 1, maximum = 255 [80]

Keypad Mode

[Session 1].Keypad Mode Session 2.Keypad Mode [Numeric] Application

▶ Local Echo

[Session 1].Local Echo Session 2.Local Echo Enabled [Disabled]

▶ Lock Mode

[Session 1].Lock Mode Session 2.Lock Mode Enabled [Disabled]

▶ RS-232 Stop Bits (6400 and 5055 computers)

[Session 1].RS232 StopBits Session 2.RS232 StopBits [1] 2

▶ **RS-232 Data Bits** (6400 and 5055 computers)

[Session 1].RS232 DataBits Session 2.RS232 DataBits 7 [8]

RS-232 Parity (6400 and 5055 computers)

[Session 1].RS232 Parity Session 2.RS232 Parity [NONE] **EVEN** ODD

▶ **RS-232 Baud Rate** (6400 and 5055 computers)

[Session 1].RS232 BaudRate Session 2.RS232 BaudRate 1200 2400 4800 [9600] 19200 38400

▶ **RS-232 Flow** (6400 and 5055 computers)

[Session 1].RS232 Flow Session 2.RS232 Flow [NONE] DTR XON/XOFF

▶ **RS-232 Stream** (not supported on 6400 and 5055 computers)

[Session 1].RS232 Stream Session 2.RS232 Stream Enabled [Disabled]

▶ Screen Lock

[Session 1].Screen Lock Session 2.Screen Lock Enabled [Disabled]

▶ Send XON

[Session 1].Send XON Session 2.Send XON [Enabled] Disabled

▶ Terminal Mode

[Session 1].Terminal Mode Session 2.Terminal Mode [7-Bit] 8-Bit

► Terminal Setup

[Session 1].Term Setup Session 2.Term Setup **ANSI** VT100 VT220 VT320 [VT340]

▶ VT Cursor Mode

[Session 1].VT Cursor Mode Session 2.VT Cursor Mode [Cursor] Application

▶ VT220 Mode

[Session 1].VT220 Mode Session 2.VT220 Mode [Char] Block

Display Options

NOTE:

Display options apply only to the 6400 and 5055 computers.

▶ Backlight State

[Session 1].Backlight State Session 2.Backlight State Enabled [Disabled]

▶ Backlight Timer (6400 computer)

[Session 1].Backlight Timer Session 2.Backlight Timer Numeric, minimum = 0, maximum = 255 [0]

▶ Cursor Mode

[Session 1].Cursor Mode Session 2.Cursor Mode Underln Blink Block Blink Underline [Block]

Radio Communications Options

NOTE:

Radio Communications options do not apply to 2415, 2425, 2455, and 248X terminals. For these terminals, set the Security ID through the TRAKKER Antares 2400 Menu System.

▶ Baud Rate (UHF radio)

Radio Baud Rate 4800 4800/9600 9600 The default depends on the type of radio in the terminal.

Protocol (6400 and 5055 computers)

Radio Protocol SST SST-Diag Mode

Security ID

[Session 1].Security ID Session 2.Security ID String, minimum length=0, maximum length=16 [null string]

More Options

▶ Change Menu Password

The password must be **enabled** and **set** for access to the Main Menu before you can change it. To set the password:

```
[Session 1]. Change Menu Password
Session 2. Change Menu Password
  String, minimum length = 1, maximum length = 10
  [3193693]
```

To enable the password, see "Main Menu password."

► COM Select (5055 computer)

[Session 1].Com Select Session 2.Com Select [COM 1] COM 2

Main Menu Password

The password must be **enabled** and **set** for access to the Main Menu. To enable or disable the password:

[Session 1].Menu Password Session 2.Menu Password Enabled [Disabled]

To set the password, see "Change menu password".

▶ **Print Device** (6400 computer)

[Session 1].Print Device Session 2.Print Device [RS232 Print] **IRDA** Print

LCD Options

▶ Annunciator Format

[Session 1].Annun Format Session 2.Annun Format [Vertical] 2455 and 248X terminals, and 5055 computer [Horizontal] 2415 and 2425 terminals, and 6400 computer

Annunciator Position

[Session 1].Annun Position Session 2.Annun Position Upper Right Upper Left Lower Right [Lower Left] Stealth

▶ Define Height (Scroll Window)

[Session 1].Define Height Session 2.Define Height Numeric, minimum = 1, maximum = 24 [8]

▶ Define Width (Scroll Window)

[Session 1].Define Width Session 2.Define Width Numeric, minimum = 1, maximum = 80 [8]

▶ **Key Uppercase** (6400 and 5055 computers)

[Session 1].Key Uppercase Session 2.Key Uppercase [Enabled] Disabled

▶ Screen Mode

[Session 1].Screen Mode Session 2.Screen Mode Center Cursor [Corner Mode] Page Mode Lazy Mode Locked Mode

▶ **Screen Columns** (6400 and 5055 computers)

[Session 1].Screen Cols
Session 2.Screen Cols
Numeric, minimum = 1, maximum = 255
16
17
40
[80] 5055 computer
[20] 6400 computer standard and wide displays

▶ **Screen Rows** (6400 and 5055 computers)

```
[Session 1].Screen Rows
Session 2.Screen Rows
  Numeric, minimum = 1, maximum = 255
  8
  10
  [25] 5055 computer
  [18] 6400 computer standard display; [16] for wide display
```

Scroll Window

```
[Session 1].Scroll Window
Session 2.Scroll Window
  Screen Size
  Scroll Setting
  [Tab Size]
```

Beeper Setup Options

▶ Beep Internal

```
[Session 1].Beep Internal
Session 2.Beep Internal
  [Enabled]
  Disabled
```

▶ Beeper (Error Tone) Frequency (6400 computer)

```
[Session 1].Beep Frequency
Session 2.Beep Frequency
  Numeric, minimum = 0, maximum = 30 [6]
```

▶ Beeper (Error Tone) Length

```
[Session 1].Beep Length
Session 2.Beep Length
  Numeric, minimum= 1, maximum= 10 [3]
```

► Key Click Frequency (6400 computer)

```
[Session 1].KeyClick Freq
Session 2.KeyClick Freq
  Numeric, minimum = 0, maximum = 30 [6]
```

▶ **Key Click Length** (6400 and 5055 computers)

```
[Session 1].KeyClick Length
Session 2.KeyClick Length
  Numeric, minimum = 1, maximum = 10 [6]
```

More (Main Menu 2) Option

► Foreground Session (6400 and 5055 computers)

```
Foreground Sess
  [Session 1]
  Session 2
```

▶ **Set Hot Key** (6400 and 5055 computers)

```
[Session 1].Set Hot Key
Session 2.Set Hot Key
  F1
  through
  F24
```

▶ Type-Ahead

```
[Session 1]. Type-Ahead
Session 2. Type-Ahead
  [Enabled]
  Disabled
```

Additional Parameters

The following parameters do not have equivalent TE configuration menu options.

▶ Alternate Screen Columns (6400 and 5055 computers)

```
[Session 1].Alt Screen Cols
Session 2.Alt Screen Cols
  Numeric, minimum = 1, maximum = 255
  17
  [40] 5055 computer
  [20] 6400 computer
```

▶ Alternate Screen Rows (6400 and 5055 computers)

```
[Session 1].Alt Screen Rows
Session 2.Alt Screen Rows
  Numeric, minimum = 1, maximum = 255
  [12] 5055 computer
  [18] 6400 computer standard display and [16] for wide display
```

▶ Contrast Mode

```
[Session 1].Contrast Mode
Session 2.Contrast Mode
  Compensated
  Absolute
```

▶ **Program Name** (appears on the initialization and version screens)

Program Name

String, minimum length = 8, maximum length = 8 [the default program names are the "FWP" names listed under "Program Names" in the Getting Started section]

▶ **Program Version** (appears on the initialization and version screens)

Program Version

String, minimum length = 4, maximum length = 4 [?.??]

▶ **Return Result** (this is a test feature for VT/ANSI emulation; if it is disabled, extended commands will not return a result to the host application)

Return Result

[Enabled]

Disabled

▶ **Set-Up Parms Menu Password** (the password is case sensitive for 6400 and 5055 computers; it is case insensitive for 2415, 2425, 2455, and 248X terminals)

[Session 1].Password

Session 2.Password

String, minimum length = 1, maximum length = 10 [CR52401]

Changing Text

You can change the text of TE configuration menus, configuration parameters, or system messages by modifying file CFGLIT.DAT. This file contains the strings that appear in the configuration menus, parameter set-up files, and system messages.

An identification (ID) number identifies each literal string. To create your own literal file, you create a text file that associates these numbers with the actual literal strings. You then use MAKELIT.EXE to convert the text file to a format the configuration program can use.

Each line in the literal text file begins with the literal ID number. After the ID number, you type the quoted string that is used when that ID number is referenced. If you omit an ID number, its string appears as "Bad Literal File" when you run the program in the terminal.

Literal ID numbers are available upon request from Intermec. Contact your Intermec representative for more information about ID numbers.

You can create a sample file containing the default literal strings by using the MAKELIT.EXE program to "reverse engineer" the standard CFGLIT.DAT file. To do this, type the following command line to unpack CFGLIT.DAT into a file named CFGLIT.TXT:

makelit -r cfglit.dat cfglit.txt

The CFGLIT.TXT file this command creates contains all the default strings the configuration program uses.

One line in CFGLIT.TXT looks like this:

0x2f10 "RS232 PORT\nIN USE\n\nPLEASE WAIT!"

"0x2f10" is the literal ID number for the RS-232 port-in-use message that appears when a host computer sends an RS-232 command to the TE program. The text of the message follows the ID number in a quoted string. The embedded "\n" sequence within the quoted string indicates a "new line" character and outputs a carriage return/line feed.

To change the text of the message that appears, change the quoted string. For example, you could change the above line to look like this:

0x2f10 "Printing\nPlease Wait!"

When you have a text file with one line for every ID number, use MAKELIT.EXE to convert the file to an indexed literal file. If your text file is named CFGLIT.TXT, you would type the following command:

makelit cfglit.txt cfglit.dat

This command creates the new literal file CFGLIT.DAT. For instructions on how to download the file, see "Downloading Files" later in this section.

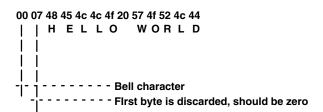
Preinitializing the VT/ANSI TE Program

You can preinitialize the VT/ANSI TE program. You must name the VT/ANSI initialization file as VT220.INI. The file is processed when you reset or warm start the terminal. The file is processed as if the radio had received the data, and must be in the "on-air" format. For instructions on how to download the file, see "Downloading Files" later in this section.

Data is encoded in binary format. To create VT220.INI, you may need a HEX editor or other special program.

VT220.INI starts with a single byte that the terminal ignores. This byte should always be 0 (zero). The remainder of the file contains standard VT/ANSI terminal escape sequences.

The following example shows how to display "HELLO WORLD" and beep the beeper from within a data stream initialization file. The line of hexadecimal digits represent the binary values that must be stored in the initialization files.



Remapping the Terminal's Keys

You may need to remap the terminal's keys if your users need to press a key in VT/ANSI TE that is not on a standard 101-key keyboard. You can also remap a terminal key to transmit a text string or message to the host computer.

To remap the terminal keys, you modify the REMAP.CFG file and add a Remap command to remap a terminal key. You can remap a single key or a two-key sequence. You can add a Remap command or create a macro in the REMAP.CFG file that remaps a single key or a two-key sequence.

You can remap any terminal key or two-key sequence that does not perform a specific function on the terminal. For example, you can remap the [B] key because it only types the lowercase letter B. You can also remap [CTRL] [B] because it does not perform any function on the terminal.

NOTE:

On the 2425, 2455, and 248X, you cannot remap the two-key sequence -f \triangle because it moves the window/viewport up on the Trakker Antares terminals.

Each terminal key or two-key sequence generates a 4-digit hexadecimal remap code as listed in the key code table later in this section. The key code table gives the 4-digit hexadecimal codes for ASCII characters for the terminals. These codes identify the key or keys pressed. For example:

Key	Action	4-Digit Hex Key Code	
[B]	Types a lowercase B	0062	_
[SHIFT] [B]	Types an uppercase B	0042	
[CTRL] [B]	None	0002	

Remapping a Key or Two-Key Sequence

The procedure for remapping a key sequence depends on the type of terminal you are using.

2415, 2425, 2455, or 248X Terminal

- 1. Choose the key or two-key sequence to remap and determine the current 4-digit hexadecimal code of the keys and the code you will enter to remap the keys. For help, see the key code table later in this section.
- 2. Connect the terminal to your PC.
- 3. Use FileCopy to upload REMAP.CFG from the terminal's drive C to your PC. For help using FileCopy, use the online Help.

NOTE:

You can also upload the configuration file using RF and Ethernet communications. For help, see your terminal's user manual.

4. For FileCopy versions earlier than 3.0, remove everything, including blank space, at the end of the REMAP.CFG file up to the last readable line of code. Earlier versions of FileCopy fill in the last data block with Ctrl Z, and if you download the REMAP.CFG file with this fill-in character in it, the file will not run. For example, you might see and need to delete the following at the end of REMAP.CFG:

5. Using any text editor, add the Remap command at the end of the REMAP.CFG file:

remap=<key>="string"

where:

remap	is the command you enter in REMAP.CFG.
key	is the 4-digit hexadecimal key or keys you are remapping.
string	is the new function for the key or keys. The string can be a text string, ASCII mnemonic, or another 2-byte hexadecimal code. Enclose the entire string in quotation marks.

- 6. Save REMAP.CFG.
- 7. Download REMAP.CFG to drive C on your terminal.

6400 or 5055 Computer

- 1. Choose the key or two-key sequence to remap and determine the current 4-digit hexadecimal code of the keys and the code you will enter to remap the keys. For help, see the key code table later in this section.
- 2. Upload REMAP.CFG from the computer's drive C to your PC.

To upload REMAP.CFG to a 6400 or 5055 computer, you must configure INTERLNK on a desktop or laptop PC. INTERLNK, a part of MS-DOS, is a device driver that connects your 6400 or 5055 computer and PC through their serial ports. This connection enables you to exchange files. It also enables you to edit the 6400 or 5055 computer's configuration files.

INTERSVR is the INTERLNK server and is a communications option on your 6400 or 5055 computer. INTERLNK and INTERSVR are provided with DOS and shipped with your 6400 or 5055 computer toolkit.

For complete installation instructions, refer to the README.TXT file provided with 6400 and 5055 computers.

Using any text editor, add the Remap command at the end of the REMAP.CFG file:

remap=<key>="string"

where:

remap is the command you enter in REMAP.CFG.

is the 4-digit hexadecimal key or keys you are remapping. keν

is the new function for the key or keys. The string can be a text string

string, ASCII mnemonic, or another 2-byte hexadecimal code.

Enclose the entire string in quotation marks.

- Save REMAP.CFG.
- 5. Use INTERSVR/INTERLNK to download REMAP.CFG to drive C on your computer.

Examples

EXAMPLE 1:

Suppose you want to remap () B on your 2425 to send a message and then enter a carriage return. In the REMAP.CFG file, add this command:

remap=<0002>="My battery is low.<CR>"

EXAMPLE 2:

To remap the function of the function keys to another key, replace string with the transmitted code for the function and replace key with the 4-digit hexadecimal key that will do the function. For example, suppose you wanted to remap (F) on your 2425 to the function of (R) and then enter a carriage return. In the REMAP.CFG file, add this command:

remap=<1031>="<ESC>OR<CR>"

To find the transmitted code for a key, see Section 6, "Programming."

Creating a Macro

The procedure for creating a macro depends on the type of terminal you are using.

2415, 2425, 2455, or 248X Terminal

- 1. Choose the key or two-key sequence that you want to use for the macro and the key or two-key sequence that will activate the macro.
- 2. Determine the current 4-digit hexadecimal code of the macro and the activation keys. For help, see the key code table later in this section.
- 3. Connect the Trakker Antares terminal to your PC.
- 4. Use FileCopy to upload REMAP.CFG from the terminal's drive C to your PC. For help using FileCopy, use the online Help.

NOTE:

For the 2415, 2425, 2455, or 248X terminal, you can also upload the configuration file using RF and Ethernet communications. For help, see the terminal's user manual.

5. For FileCopy versions earlier than 3.0, remove everything, including blank space, at the end of the REMAP.CFG file up to the last readable line of code. Earlier versions of FileCopy fill in the last data block with Ctrl Z, and if you download the REMAP.CFG file with this fill-in character in it, the file will not run. For example, you might see and need to delete the following at the end of REMAP.CFG:

6. Using any text editor, add the Macro command to the end of the REMAP.CFG file:

macro=<key>="string"

where:

is the command you enter in REMAP.CFG. macro

is the 4-digit hexadecimal key or keys you are remapping. key

is the new action for the key or keys. The string can be a text string

string, ASCII mnemonic, or another 2-byte hexadecimal code.

Enclose the entire string in quotation marks.

7. At the end of the macro, type:

runmacro=<key>

where key is the 4-digit hexadecimal code that identifies the key or keys that activate the macro.

- 8. Save REMAP.CFG.
- 9. Download REMAP.CFG to drive C on your terminal.

EXAMPLE:

You can assign \triangle B to activate a macro that remaps B to send the message, "Change the battery pack now." The terminal sends the uppercase letter B except when you press [\triangle] B to use the macro.

6400 or 5055 Computer

- 1. Choose the key or two-key sequence that you want to use for the macro and the key or two-key sequence that will activate the macro.
- 2. Determine the current 4-digit hexadecimal code of the macro and the activation keys. For help, see the key code table later in this section.
- 3. Upload REMAP.CFG from the computer's drive C to your PC.

To upload REMAP.CFG to a 6400 or 5055 computer, you must configure INTERLNK on a desktop or laptop PC. INTERLNK, a part of MS-DOS, is a device driver that connects your 6400 or 5055 computer and PC through their serial ports. This connection enables you to exchange files. It also enables you to edit the 6400 or 5055 computer's configuration files.

INTERSVR is the INTERLNK server and is a communications option on your 6400 or 5055 computer. INTERLNK and INTERSVR are provided with DOS and shipped with your 6400 or 5055 computer toolkit.

For complete installation instructions, refer to the README.TXT file provided with 6400 and 5055 computers.

4. Using any text editor, add the Macro command to the end of the REMAP.CFG file:

macro=<key>= "string"

where:

macro is the command you enter in REMAP.CFG.

is the 4-digit hexadecimal key or keys you are remapping. keν

is the new action for the key or keys. The string can be a text string

string, ASCII mnemonic, or another 2-byte hexadecimal code.

Enclose the entire string in quotation marks.

5. At the end of the macro, type:

runmacro=<key>

where key is the 4-digit hexadecimal code that identifies the key or keys that activate the macro.

- 6. Save REMAP.CFG.
- 7. Use INTERSVR/INTERLNK to download REMAP.CFG to drive C on your computer.

EXAMPLE:

You can assign [CTRL] [B] to activate a macro that remaps [B] to send the message, "Change the battery pack now." The terminal sends the uppercase letter B except when you press [CTRL] [B] to use the macro.

Key Code Table

```
/* F1 key */
remap=<1031>="string"
remap=<1032>="string"
                          /* F2 key */
remap=<1033>="string"
                          /* F3 kev */
remap=<1034>="string"
                          /* F4 kev */
remap=<1035>="string"
                          /* F5 kev */
remap=<1036>="string"
                          /* F6 key */
remap = <1037 > = "string"
                          /* F7 key */
                          /* F8 key */
remap=<1038>="string"
remap=<1039>="string"
                          /* F9 key */
remap=<1061>="string"
                          /* F10 kev */
remap=<1062>="string"
                          /* F11 key */
remap=<1063>="string"
                          /* F12 key */
remap=<1064>="string"
                          /* F13 key */
remap=<1065>="string"
                          /* F15 key */
remap=<1066>="string"
                          /* F16 key */
                          /* F17 kev */
remap=<1067>="string"
remap=<1068>="string"
                          /* F18 key */
remap=<1069>="string"
                          /* F19 kev */
remap=<106a>="string"
                          /* F20 key */
remap=<106b>="string"
                          /* F21 key */
remap=<106c>="string"
                          /* F22 key */
remap=<106d>="string"
                          /* F23 kev */
                          /* F24 kev */
remap=<106e>="string"
remap=<1042>="string"
                          /* Back Tab kev */
remap=<1044>="string"
                          /* Del key */
remap=<1045>="string"
                          /* Enter key */
                          /* Insert key */
remap=<1049>="string"
remap=<104c>="string"
                          /* Window/viewport left key */
remap=<1055>="string"
                          /* Window/viewport up key */
remap=<1056>="string"
                          /* Window/viewport down key */
remap = <105a > = "string"
                          /* Window/viewport right key */
remap=<0009>="string"
                          /* Tab key */
                            /* Backspace kev */
remap=<0008>="string"
remap=<304c>="string"
                          /* Page left key */
remap=<3055>="string"
                          /* Page up key */
                          /* Page down kev */
remap = <3056 > = "string"
                          /* Page right kev */
remap = <305a > = "string"
remap=<2041>="string"
                          /* Auto-Login Restart key */
remap=<206c>="string"
                          /* Menu key */
remap=<6061>="string"
                          /* Find key */
                          /* Insert here key */
remap = <6062 > = "string"
remap=<6063>="string"
                          /* Remove key */
remap=<6064>="string"
                          /* Select key */
remap=<6065>="string"
                          /* Previous screen key */
remap=<6066>="string"
                          /* Next screen key */
remap=<6067>="string"
                          /* Keypad key */
remap=<6068>="string"
                          /* Keypad Enter key */
remap=<6069>="string"
                          /* Keypad 0 key */
                          /* Keypad 1 key */
remap = <606a > = "string"
remap=<606b>="string"
                          /* Keypad 2 key*/
remap=<606c>="string"
                          /* Keypad 3 key*/
```

```
remap=<606d>="string"
                         /* Keypad 4 key*/
remap=<606e>="string"
                         /* Keypad 5 key*/
remap=<606f>="string"
                         /* Keypad 6 key*/
remap=<6070>="string"
                         /* Keypad 7 key*/
remap=<6071>="string"
                         /* Keypad 8 key*/
remap=<6072>="string"
                         /* Keypad 9 key*/
remap=<6073>="string"
                         /* Keypad . key*/
remap=<6077>="string"
                         /* Keypad - key*/
                         /* Keypad + key*/
remap=<6078>="string"
                         /* 0 kev*/
remap=<0030>="string"
remap=<0031>="string"
                         /* 1 kev*/
                         /* 2 key*/
remap=<0032>="string"
remap=<0033>="string"
                         /* 3 key*/
remap=<0034>="string"
                         /* 4 key*/
remap=<0035>="string"
                         /* 5 kev*/
remap=<0036>="string"
                         /* 6 kev*/
remap=<0037>="string"
                         /* 7 key*/
remap=<0038>="string"
                         /* 8 kev*/
remap=<0039>="string"
                         /* 9 key*/
                         /* A kev*/
remap=<0041>="string"
                         /* B kev*/
remap=<0042>="string"
remap=<0043>="string"
                         /* C kev*/
remap=<0044>="string"
                         /* D key*/
remap=<0045>="string"
                         /* E key*/
remap=<0046>="string"
                         /* F key*/
remap=<0047>="string"
                         /* G key*/
remap=<0048>="string"
                         /* H kev*/
remap=<0049>="string"
                         /* I key*/
remap=<004a>="string"
                         /* J key*/
remap=<004b>="string"
                         /* K key*/
                         /* L key*/
remap=<004c>="string"
remap=<004d>="string"
                         /* M key*/
remap=<004e>="string"
                         /* N kev*/
remap=<004f>="string"
                         /* O key*/
remap=<0050>="string"
                         /* P key*/
remap=<0051>="string"
                         /* Q key*/
                         /* R key*/
remap=<0052>="string"
                         /* S kev*/
remap=<0053>="string"
remap=<0054>="string"
                         /* T kev*/
remap=<0055>="string"
                         /* U kev*/
remap=<0056>="string"
                         /* V key*/
remap=<0057>="string"
                         /* W key*/
remap=<0058>="string"
                         /* X key*/
remap=<0059>="string"
                         /* Y kev*/
remap = <005a > = "string"
                         /* Z key*/
remap=<0061>="string"
                         /* a kev*/
remap=<0062>="string"
                         /* b key*/
remap=<0063>="string"
                         /* c kev*/
                         /* d key*/
remap=<0064>="string"
remap=<0065>="string"
                         /* e kev*/
remap=<0066>="string"
                         /* f key*/
remap=<0067>="string"
                         /* g key*/
                         /* h key*/
remap=<0068>="string"
remap=<0069>="string"
                         /* i key*/
```

```
remap=<006a>="string"
                          /* j key*/
remap=<006b>="string"
                          /* k key*/
remap=<006c>="string"
                          /* l key*/
remap=<006d>="string"
                          /* m kev*/
                          /* n key*/
remap=<006e>="string"
remap=<006f>="string"
                          /* o kev*/
remap=<0070>="string"
                          /* p key*/
                          /* q key*/
remap=<0071>="string"
remap=<0072>="string"
                          /* r key*/
remap=<0073>="string"
                          /* s key*/
remap=<0074>="string"
                          /* t kev*/
remap=<0075>="string"
                          /* u key*/
remap=<0076>="string"
                          /* v key*/
remap=<0077>="string"
                          /* w key*/
remap=<0078>="string"
                          /* x key*/
remap=<0079>="string"
                          /* y key*/
remap=<007a>="string"
                          /* z key*/
remap=<0020>="string"
                          /* SPACE kev */
remap=<0021>="string"
                          /*! kev */
                          /* " key */
remap=<0022>="string"
                          /* # key */
remap=<0023>="string"
remap = <0024 > = "string"
                          /* $ kev */
remap=<0025>="string"
                          /* % kev */
                          /* & key */
remap=<0026>="string"
remap=<0027>="string"
                          /* ' key */
remap=<0028>="string"
                          /* ( key */
                          /* ) key */
remap=<0029>="string"
remap=<002a>="string"
                          /* * kev */
remap=<002b>="string"
                          /* + key */
remap=<002c>="string"
                          /* , key */
remap=<002d>="string"
                          /* - key */
remap=<002e>="string"
                          /* . kev */
remap=<002f>="string"
                          /* / key */
remap=<003a>="string"
                          /* : key */
                          /*; key */
remap=<003b>="string"
remap=<003c>="string"
                          /* < \text{kev } * /
remap=<003d>="string"
                          /* = key */
remap=<003e>="string"
                          /* > \text{key } * /
                          /* ? kev */
remap=<003f>="string"
                          /* @ kev */
remap=<0040>="string"
                          /* [ key */
remap=<005b>="string"
remap=<005c>="string"
                          /* \ key */
remap=<005d>="string"
                          /* ] key */
                          /* ^ key */
remap=<005e>="string"
remap=<005f>="string"
                          /* kev */
                          remap=<0060>="string"
remap=<007b>="string"
                          /* { kev */
remap=<007c>="string"
                          /* | key */
remap=<007d>="string"
                          /* } kev */
remap=<007e>="string"
                          /* ~ key */
                          /* Del kev */
remap=<007f>="string"
```

Remapping Characters

You can use display character translation files to remap characters as they are written to the display. The translation file name for VT/ANSI TE must be VT220.XLT. For instructions on how to download the file to the terminal, see "Downloading Files" later in this section.

Display character translation files are binary files consisting of ordered pairs of eight bit values. Each pair of values remaps a displayable character to a different displayable character.

- ▶ The first byte of a pair is the ASCII value of the character to be replaced.
- ▶ The second byte of a pair is the ASCII value that replaces the first.

These translations are only made when a character is written to a display device. If the character is sent to the host (keystroke or scan data for example) or sent to an external device (such as a printer), it is sent as the original, untranslated value.

Suppose you want a terminal running VT/ANSI emulation to replace the uppercase B with the Greek letter beta, and replace the uppercase Z with the Greek letter omega. Create a file named VT220.XLT that is four bytes long (two ordered pairs of two bytes each). The file should contain the following four bytes in this order:

0x42

0xE1

0x5A

0xEA

These represent the ASCII display character set values for B, beta, Z, and omega, respectively.

Downloading Files

2415, 2425, 2455, or 248X Terminal

You can use one of several methods to download a file to a 2415, 2425, 2455, or 248X terminal, including:

▶ FileCopy through a serial connection from your Trakker Antares terminal to your personal computer

NOTE:

You must use the latest version of the T24FCOPY FileCopy utility and do a Ymodem transfer of the data. Do not do an Xmodem transfer.

- The Download Server feature on the DCS 300 to a Trakker Antares terminal loaded with UDP Plus protocol
- ▶ The Receive File reader command
- ▶ The TFTP application on a personal computer or host to a Trakker Antares terminal loaded with the TCP/IP protocol

To use these methods, refer to your terminal's user manual for help.

To restart your TE application, do one of the following:

► Scan this bar code label:



You can also send the Reset Firmware command over the network. For help, refer to your terminal's user manual.

- ▶ Use the TRAKKER Antares 2400 Menu System to configure the Resume Execution command to resume "not allowed." Choose Terminal Menu from the Configuration Menu and then choose Power Management. Each time you press vo turn on the Trakker Antares terminal, it boots and restarts your application. For more information, refer to your terminal's user manual.
- ▶ Access the TRAKKER Antares 2400 Menu System and select the TE application through the File Manager option. For help, refer to your terminal's user manual.

The Trakker Antares terminal restarts your TE application using the configuration saved in CONFIG.DAT.

6400 or 5055 Computer

Before you can download a file to a 6400 or 5055 computer, you must configure INTERLNK on a desktop or laptop PC. INTERLNK, a part of MS-DOS, is a device driver that connects your 6400 or 5055 computer and PC through their serial ports. This connection enables you to exchange files. It also enables you to edit the 6400 or 5055 computer's configuration files, such as CONFIG.DAT.

INTERSVR is the INTERLNK server and is a communications option on your 6400 or 5055 computer. INTERLNK and INTERSVR are provided with DOS and shipped with your 6400 or 5055 computer toolkit.

For complete installation instructions, refer to the README.TXT file provided with 6400 and 5055 computers.

Section 6

Programming

Overview

This section describes programming for the terminals. This section contains the following information:

- ▶ The received codes the terminals support. Received codes include C0 and C1 control characters, character sets, and terminal modes.
- The transmitted codes generated by the terminals' keys and sent to the host computer.
- ▶ The capability of the terminals to emulate VT/ANSI terminal top-row function, main keypad, editing, and auxiliary keys.
- VT330/VT340 terminal applications supported by the terminals. Applications include working in local editing and interactive modes, and creating text forms.

Character Encoding

The implementation of VT/ANSI terminal emulation supports both 7-bit and 8-bit communications environments. The implementation consists of an 8-bit asynchronous character encoding scheme and a 7-bit code extension technique so that the terminal is compatible with ANSI and ISO standards. All 8-bit codes can be referenced by using two-byte ESCape sequences in accordance with ANSI standard X3.41 -- 1974.

The document commonly referred to when ANSI is mentioned is ANSI X3.64 --1979, Additional Controls for Use With American National Standard for Information Interchange. The ANSI X3.64 standard controls character imaging devices such as the VT200 terminal. ANSI and ISO determine the current standards for character encoding in the communications industry.

Character Sets

The terminal processes most characters it receives from the host computer based on characters whose codes and functions are defined and standardized by ANSI. The types are 7-bit and 8-bit character codes.

Multinational Character Set

The DEC multinational character set consists of C0, GL, C1, and GR codes.

C0 and GL Codes

The left half of the multinational character set consists of control characters (C0 codes) and graphic characters (GL codes). Control characters are 7-bit compatible, nondisplayable single-byte characters that perform specific functions during communications and text processing. C0 codes range from 00 to 1F hexadecimal, and include 7F hexadecimal (DEL). They can be used in a 7-bit or an 8-bit environment.

Graphic characters are 7-bit compatible, displayable characters that represent various alphanumeric characters, punctuation marks, and symbols that appear in the terminal's display. GL codes range from 21 to 7E hexadecimal. They can be used in a 7-bit or an 8-bit environment. The space character (20 hexadecimal) may be a graphic character or a control character, depending on the context.

Table 6-1 shows the C0 and and GL codes recognized by the terminal. Ignored codes are parsed (removed) from the data stream with no action taken by the terminal. Codes that the terminal ignores are also indicated in the table. Table 6-2 describes the action taken by the terminal when it receives a C0 code.

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Table 6-1 **C0 and GL Codes**

row	column	0		1		2		3		4		5		6		7	
	b8 bits b7 b6 b5 b4 b3 b2 b1	0 0	0	0 0	1	0 0 1	0	0 0 1 1		0 1 0	1		1 0 1		0	0 1 1	1
0	0 0 0 0	NUL	00	DLE	16 10	SP	32 20	0	48 30	@	64 40	Р	80 50	6	96 60	р	112 70
1	0 0 0 1	soн	1 01	DC1 (XON)	17 11	!	33 21	1	49 31	Α	65 41	Q	81 51	а	97 61	q	113 71
2	0 0 1 0	STX	2 02	DC2	18 12	"	34 22	2	50 32	В	66 42	R	82 52	b	98 62	r	114 72
3	0 0 1 1	ETX	3 03	DC3 (XOFF)	19 13	#	35 23	3	51 33	С	67 43	s	83 53	С	99 63	s	115 73
4	0 1 0 0	ЕОТ	4 04	DC4	20 14	\$	36 24	4	52 34	D	68 44	Т	84 54	d	100 64	t	116 74
5	0 1 0 1	ENQ	5 05	NAK	21 15	%	37 25	5	53 35	E	69 45	U	85 55	е	101 65	u	117 75
6	0 1 1 0	ACK	6 06	SYN	22 16	&	38 26	6	54 36	F	70 46	V	86 56	f	102 66	v	118 76
7	0 1 1 1	BEL	7 07	ЕТВ	23 17	,	39 27	7	55 37	G	71 47	w	87 57	g	103 67	w	119 77
8	1000	BS	8 08	CAN	24 18	(40 28	8	56 38	Н	72 48	х	88 58	h	104 68	х	120 78
9	1 0 0 1	НТ	9 09	EM	25 19)	41 29	9	57 39	ı	73 49	Υ	89 59	i	105 69	у	121 79
Α	1010	LF	10 0A	SUB	26 1A	*	42 2A	:	58 3A	J	74 4A	z	90 5A	j	106 6A	z	122 7A
В	1011	VT	11 0B	ESC	27 1B	+	43 2B	;	59 3B	К	75 4B]	91 5B	k	107 6B	{	123 7B
С	1 1 0 0	FF	12 0C	FS	28 1C	,	44 2C	<	60 3C	L	76 4C	١	92 5C	I	108 6C		124 7C
D	1 1 0 1	CR	13 0D	GS	29 1D	-	45 2D	=	61 3D	М	77 4D]	93 5D	m	109 6D	}	125 7D
E	1110	so	14 0E	RS	30 1E		46 2E	>	62 3E	N	78 4E	۸	94 5E	n	110 6E	~	126 7E
F	1111	SI	15 0F	US	31 1F	1	47 2F	?	63 3F	0	79 4F	_	95 5F	o	111 6F	DEL	127 7F
		— (CO C	odes-		←				— (GL C	odes -					

(ASCII Graphics Character Set)

Legend:

ENQ 5 decimal hexadecimal code recognized by the terminal

NUL 0 decimal hexadecimal code ignored by the terminal

Programming **SECTION 6**

 ${\it Table~6-2} \\ {\it C0~Control~Characters~and~Terminal~Action}$

Mnemonic	Hex	Name	Action
NUL	00	Null	Ignored.
SOH	01	Start of heading	Ignored.
STX	02	Start of text	Ignored.
ETX	03	End of text	Ignored.
EOT	04	End of transmission	Ignored.
ENQ	05	Enquiry	Generates an Answerback message. You set the number of characters in the message (0-30) through the terminal's firmware. If the terminal is operating in ANSI mode, it ignores this character.
ACK	06	Acknowledge	Ignored.
BEL	07	Bell	Generates bell tone if bell is enabled.
BS	08	Backspace	Moves cursor one column to the left. If cursor is in Column 1, takes no action.
HT	09	Horizontal tab	Moves cursor to predetermined tab stop. Moves cursor to right margin if there are no tab stops.
LF	0A	Line feed	Causes a line feed or new line operation, depending on how the LNM received code is set.
m VT	0B	Vertical tab	Processes as LF (line feed).
\mathbf{FF}	0C	Form feed	Processes as LF (line feed).
CR	0D	Carriage return	Moves cursor to Column 1 of the current row.
SO (LS1)	0E	Shift out (Lock shift G1)	Invokes G1 character set into GL.
SI (LS0)	0F	Shift in (Lock shift G0)	Invokes G0 character set into GL.
DLE	10	Data link escape	Ignored.
DC1 (XON)	11	Device control 1	Clears DC3 if XOFF support is enabled, which causes the terminal to continue sending characters (keyboard unlocks).
DC2	12	Device control 2	Ignored.
DC3 (XOFF)	13	Device control 3	If XOFF support is enabled, causes the terminal to stop sending characters until it receives a DC1 control character.
DC4	14	Device control 4	Ignored.
NAK	15	Negative acknowledgment	Ignored.
SYN	16	Synchronous table	Ignored.
ETB	17	End transmission block	Ignored.

Table 6-2 (Continued) C0 Control Characters and Terminal Action

Mnemonic	Hex	Name	Action
CAN	18	Cancel	Terminates and cancels any sequence in progress.
$\mathbf{E}\mathbf{M}$	19	End of medium	Ignored.
SUB	1A	Substitute	Terminates and cancels the escape or control sequence, or terminates the device control string and displays reverse question mark.
ESC	1B	Escape	Processes as escape sequence introducer. Terminates any escape, control, or device control sequence in process.
FS	1C	File separator	Ignored.
GS	1D	Group separator	Ignored.
RS	1E	Record separator	If guarded area transfer mode (GATM) is reset, the record separator is processed as a protected field entry.
US	1F	Unit separator	Ignored.
DEL	7F	Delete	Ignored; it cannot be used as a fill character.

C1 and GR Codes

The right half of the DEC multinational character set consists of eight-bit control codes (C1 codes) and supplemental graphic characters (GR codes). C1 codes are nondisplayable codes that perform additional functions beyond those possible with the C0 codes. C1 codes range from 80 to 9F hexadecimal.

The supplemental graphic characters set (GR codes) range from A0 hexadecimal to FF hexadecimal. The set has alphabetic characters with accents and diacritical marks that appear in the major Western European alphabets. It also has other symbols not included in the ASCII graphics set.

Table 6-3 shows the C1 control characters and GR codes recognized by the terminal. Ignored codes are parsed (removed) from the data stream with no action taken by the terminal. Codes that the terminal ignores are also indicated in the table. Note that some letters that are normally in uppercase are converted into lowercase.

The hexadecimal values for the converted letters are:

C0, C1, C2, C8, CA, CB, CC, CD, CE, CF, D9, DA, and DB. (These values may be supported correctly in later versions.)

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Table 6-3
C1 and GR Codes

8		9		10		11		12	12		13		14		5 column		row
1 0 0	0	1 0 0	1	1 0 1	0	1 0 1	1	1 1 0	0	0		1 1 1	0	1 1	1	b8 bits b7 b6 b5 b4 b3 b2 b1	
	128 80	DCS	144 90	NBSP	160 A0	0	176 B0	à	192 C0	Đ	208 D0	à	224 E0	ð	240 F0	0 0 0 0	0
	129 81	PU1	145 91	i	161 A1	±	177 B1	á	193 C1	Ñ	209 D1	á	225 E1	ñ	241 F1	0 0 0 1	1
	130 82	PU2	146 92	¢	162 A2	2	178 B2	â	194 C2	Ò	210 D2	â	226 E2	ò	242 F2	0 0 1 0	2
	131 83	STS	147 93	£	163 A3	3	179 B3	Ã	195 C3	Ó	211 D3	ã	227 E3	ó	243 F3	0 0 1 1	3
IND	132 84	ССН	148 94	¤	164 A4	•	180 B4	Ä	196 C4	ô	212 D4	ä	228 E4	ô	244 F4	0 1 0 0	4
NEL	133 85	MW	149 95	¥	165 A5	μ	181 B5	Å	197 C5	Õ	213 D5	å	229 E5	õ	245 F5	0 1 0 1	5
SSA	134 86	SPA	150 96	1	166 A6	1	182 B6	Æ	198 C6	Ö	214 D6	æ	230 E6	ö	246 F6	0 1 1 0	6
ESA	135 87	EPA	151 97	§	167 A7	•	183 B7	Ç	199 C7	х	215 D7	ç	231 E7	÷	247 F7	0 1 1 1	7
HTS	136 88		152 98	"	168 A8	,	184 B8	è	200 C8	Ø	216 D8	è	232 E8	ø	248 F8	1 0 0 0	8
HTJ	137 89		153 99	©	169 A9	1	185 B9	É	201 C9	ù	217 D9	é	233 E9	ù	249 F9	1 0 0 1	9
VTS	138 8A		154 9A	a	170 AA	ō	186 BA	ê	202 CA	ú	218 DA	ê	234 EA	ú	250 FA	1 0 1 0	Α
PLD	139 8B	CSI	155 9B	«	171 AB	»	187 BB	ë	203 CB	û	219 DB	ë	235 EB	û	251 FB	1 0 1 1	В
PLU	140 8C	ST	156 9C	Г	172 AC	1/4	188 BC	ì	204 CC	Ü	220 DC	ì	236 EC	ü	252 FC	1 1 0 0	С
RI	141 8D	osc	157 9D	_	173 AD	1/2	189 BD	í	205 CD	Ý	221 DD	í	237 ED	ÿ	253 FD	1 1 0 1	D
SS2	142 8E	PM	158 9E	®	174 AE	3/4	190 BE	î	206 CE	Þ	222 DE	î	238 EE	Þ	254 FE	1 1 1 0	E
SS3	143 8F	APC	159 9F	_	175 AF	i	191 BF	ï	207 CF	ß	223 DF	ï	239 EF	ÿ	255 FF	1111	F
																1	

GR Codes GR Codes (DEC Supplemental Graphics)

_	Lege	end:		
	IND	132 decimal 84 hexadecimal	code recognized by the terminal	code not yet standardized by ANSI and ignored by the
	HTJ	137 decimal 89 hexadecimal	code ignored by the terminal	terminal

> Table 6-4 describes the action taken by the terminal when it receives a ${\rm C1}$ control code.

Table 6-4 C1 Control Characters and Terminal Action

Mnemonic	Hex	Name	Action
	80		Ignored.
	81		Ignored.
	82		Ignored.
	83		Ignored.
IND	84	Index	Moves cursor down one line in same column. If cursor is at bottom margin, display performs a scroll up.
NEL	85	Next line	Moves cursor to first position on next line. If cursor is at bottom margin, display performs a scroll up.
SSA	86	Start of selected area	Selects which characters on the current page the terminal can send to the host.
ESA	87	End of selected area	Ends the selected area that is sent to the host when forms are created for VT330/VT340 terminal emulation.
HTS	88	Horizontal tab set	Sets one horizontal tab stop at the column where the cursor is.
HTJ	89	Horizontal tab with justify	Ignored.
VTS	8A	Vertical tabulation set	Ignored.
PLD	8B	Partial line down	Ignored.
PLU	8C	Partial line up	Ignored.
RI	8D	Reverse index	Moves cursor up one line in same column. If cursor is at top margin, display performs a scroll down.
SS2	8E	Single shift 2	Temporarily invokes G2 character set into GL for the next graphic character. G2 is designated by a select character set (SCS) sequence.
SS3	8F	Single shift 3	Temporarily invokes G3 character set into GL for the next graphic character. G3 is designated by a select character set (SCS) sequence.
DCS	90	Device control string	Processes as opening delimiter of a device control string for device control use.
PU1	91	Private use 1	Ignored.
PU2	92	Private use 2	Ignored.
STS	93	Set transmit state	Ignored.
CCH	94	Cancel character	Ignored.

Table 6-4 (Continued) C1 Control Characters and Terminal Action

Mnemonic	Hex	Name	Action
MW	95	Message waiting	Ignored.
SPA	96	Start of protected area	Starts the protected area in page memory that cannot be edited when forms are created from the host.
EPA	97	End of protected area	Ends the protected area in page memory that cannot be edited when forms are created from the host.
	98		Ignored.
	99		Ignored.
	9A		Ignored.
CSI	9B	Control sequence introducer	Processes as control sequence introducer.
ST	9C	String terminator	Processes as the closing delimiter of a string opened by DCS. Also, processes the code as the end of a line of extended command characters.
OSC	9D	Operating system command	Ignored.
PM	9E	Privacy message	Ignored.
APC	9F	Application program command	Processes the code as the start of a line of extended command characters.

Display Controls Mode

The terminal does not support the VT/ANSI terminal display controls mode, which displays control codes as graphic characters for debugging.

Dynamically Redefinable Character Set

The terminal does not support the dynamically redefinable character set (DRCS), which is a 94-character set you can create on the VT/ANSI terminal and down-line load into the terminal DRCS buffer.

Special Graphics Character Set

The terminal supports most of the DEC special graphics character set. The set contains ASCII C0 codes and most of the GL codes. It also has special symbols and short line segments. You would normally use these characters to create a limited range of drawings while working in text mode.

> Table 6-5 shows special graphics characters recognized by the terminal. Ignored codes are parsed (removed) from the data stream with no action taken by the terminal. Codes the terminal ignores and does not support are also indicated in the table.

 $Table\ 6-5$ Special Graphics Character Set

row	column	0		1	1			3		4		5		6		7	
	b8 bits b7 b6 b5 b4 b3 b2 b1	0 0	0	0 0	1	0 0 1	0	0 0 1	0		0 1 0 0		1	0 1 1 0		0 1 1	1
0	0 0 0 0	NUL	00	DLE	10	SP	20	0	30	@	40	Р	50		60		70
1	0 0 0 1	SOH	01	DC1 (XON)	11	!	21	1	31	A	41	Q	51		61	- SCAN 5	71
2	0 0 1 0	STX	02	DC2	12	"	22	2	32	В	42	R	52		62		72
3	0 0 1 1	ETX	03	DC3	13	#	23	3	33	С	43	s	53		63		73
4	0 1 0 0	EOT	04	DC4	14	\$	24	4	34	D	44	Т	54		64	F	74
5	0 1 0 1	ENQ	05	NAK	15	%	25	5	35	E	45	U	55		65	4	75
6	0 1 1 0	ACK	06	SYN	16	&	26	6	36	F	46	V	56		66	Τ	76
7	0 1 1 1	BEL	07	ЕТВ	17	,	27	7	37	G	47	w	57		67	Т	77
8	1000	BS	08	CAN	18	(28	8	38	н	48	Х	58		68	-	78
9	1 0 0 1	нт	09	EM	19)	29	9	39	ı	49	Υ	59		69		79
Α	1010	LF	0A	SUB	1A	*	2A	:	3A	J	4A	Z	5A	J	6A		7A
В	1 0 1 1	VT	0B	ESC	1B	+	2B	;	3B	К	4B	[5B	7	6B		7B
С	1 1 0 0	FF	0C	FS	1C	,	2C	<	зс	L	4C	١	5C	Γ	6C		7C
D	1 1 0 1	CR	0D	GS	1D	_	2D	=	3D	М	4D]	5D	L	6D		7D
E	1 1 1 0	so	0E	RS	1E		2E	>	3E	N	4E	۸	5E	+	6E		7E
F	1111	SI	0F	US	1F	/	2F	?	3F	0	4F		5F		6F		7F
	C0 Codes GL Codes (ASCII Nondisplayable (DEC Special Graphics Character Set) Control Character Set)																

Legend:

ENQ 05 code recognized by the terminal

NUL 00 code ignored by the terminal

code not supported and character displayed may change without notice

National Replacement Character Sets

The terminal supports the 7-bit national replacement character (NRC) sets for European languages. A Greek NRC set is available for 6400 and 5055 computers. The NRC sets are similar to the 7-bit ASCII set, except for a few characters. You designate the character sets as hard using escape sequence formats (page 6-12).

Table 6-6 lists the characters in each NRC set that are different from the ASCII set. The terminal does not support the character "¾" (40 hexadecimal) in the Dutch NRC set.

Table 6-6 National Replacement Character Set

	Hexadecimal												
Character Set	23	40	5B	5C	5 D	5E	5F	60	7B	7 C	7 D	7E	
ASCII	#	@	[\]	^	_	"	{		}	~	
British	£	@	[\]	^	_	"	{		}	~	
Dutch	£		ÿ	1/2		^	_	"		f	1/4	,	
Finnish	#	@	Ä	Ö	Å	Ü	_	é	ä	Ö	å	ü	
French	£	à	0	ç	§	^	_	"	é	ù	è		
French Canadian	#	à	â	ç	ê	î	_	ô	é	ù	è	û	
German	#	§	Ä	Ö	Ü	^	_	"	ä	Ö	ü	ß	
Italian	£	§	0	ç	é	^	_	ù	à	ò	è	ì	
Norwegian/Danish	#	@	Æ	Ø	Å	^	_	"	æ	Ø	å	~	
Portuguese	#	@	Ã	Ç	Õ	^	_	"	ã	ç	õ	~	
Spanish	£	§	i	Ñ	خ	^	_	"	"	0	ñ	ç	
Swedish	#	É	Ä	Ö	Å	Ü	_	é	ä	Ö	å	ü	
Swiss	ù	à	é	Ç	ê	î	è	ô	ä	Ö	ü	û	

> Table 6-7 shows characters in the Greek NRC set (applies only to 6400 and 5055computers).

Table 6-7 Greek National Replacement Character Set

row	column	0		1	1		2		3		4			6		7	
	68þils 672 652 652 64636261	2 3_)	202	?				 12		8	2 12 2 2 3 3		2 12 2 3 3		2 12 13	
0	0.0.0.0		00		10		20	•	30	ī	40	П	50	ō	60	п	70
1	D-D-D-1		01		11	-	21	±	31	Α	41	Р	51	a	61	Q	71
2	D-D-1D		02		12		22	2	32	В	42		52	β	62	ç	72
3	B-B-11		03		13	£	23	٠	33	Г	43	Σ	53	Y	63	σ	73
4	0.100		04		14		24	•	34	Δ	44	I	54	δ	64	τ	74
5	D-1D1		05		15		25	^	35	Е	45	Y	55	ε	65	U	75
6	D-110		06		16	1	26	Ä	36	Z	46	Ф	56	ç	66	ų	76
7	B-111		07		17	8	27	•	37	Н	47	х	57	П	67	х	77
8	1000		08		18		28	Έ	38	0	48	Ψ	58	8	68	ų	78
9	10.01		09		19	8	29	н	39	I	49	Q	59	ι	69	U	79
A	10.10		DA		1A		2 A	T	3A	К	4A	ĭ	5A	χ	6A	ï	7A
В	1011		08		1B	*	28	*	38	٨	48	Ÿ.	58	λ	68	Ü	78
С	1100		DC		1C	r	20	ъ	30	М	40	đ	5 0	μ	БC	ó	740
D	1101		000		1D	SHY	20	X.	30	N	40	٤	90	٧	BD	0	700
E	1110		DE		1 E		2 E	Ÿ	3E	ы	4E	Ц	5E	ξ	6E	ų.	7E
F	1-1-1-1		Œ		1 F	_	26	Ð	3	0	4	ı	9	0	æ		7

Legend:

code recognized by the terminal

code ignored by the terminal

Character Set Selection

The terminal supports hard character sets. It does not support designating soft (down-line loadable) character sets.

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Designating Hard Character Sets

Designate hard character sets using the escape sequence format in Table 6-8.

Table 6-8
Hard Character Set Escape Sequences

Escape Sequence	Designated As
Supplemental and special graphics sets:	
1B hexadecimal ESC ((Final) 28 hexadecimal	G0
1B hexadecimal 29 hexadecimal ESC) (Final)	G1
1B hexadecimal 2A hexadecimal ESC * (Final)	G2
1B hexadecimal 2B hexadecimal ESC + (Final)	G3
NRC sets:	
1B hexadecimal 2D hexadecimal ESC - (Final)	G1
1B hexadecimal ESC . (Final)	G2
1B hexadecimal ESC / (Final) 2F hexadecimal	G3

The final character in the escape sequence represents the character set you want to designate. For the terminal, the final characters are indicated in Table 6-9.

 $Table\ 6-9$ Hard Character Set Final Characters

Character Set		Final Character (Hex)
ASCII		B (42)
Special graphics		0 (30)
National replacement	British	A (41)
	Dutch	4 (34)
	Finnish*	5 (35) or C (43)
	French	R (52)
	French Canadian*	9 (39) or Q (51)
	German	K (4B)
	Italian	Y (59)
	Norwegian/Danish*	' (60) or E (45)
	Portuguese	% (25)
	Spanish	Z (5A)
	Swedish*	7 (37) or H (48)
	Swiss	= (3D)
	Greek**	6 (36) (Private extension)

 $The \ first \ code \ shown \ is \ recommended.$

Locking Shifts

The terminal applies the locking shift (LS) control functions in Table 6-10. Locking shifts LS1R, LS2, LS2R, LS3, and LS3R are not available in VT100 mode or ANSI mode.

Table 6-10 Locking Shifts

Control Name	Code	Function
LS0	SI	Map G0 into GL (default).
(Locking shift 0)	(0F hexadecimal)	_
LS1	SO	Map G1 into GL.
(Locking shift 1)	(0E hexadecimal)	_
LS1R*	ESC ~	Map G1 into GR.
(Locking shift 1, right)	(1B, 7E hexadecimals)	_
LS2*	ESC n	Map G2 into GL.
(Locking shift 2)	(1B, 6E hexadecimals)	
LS2R*	ESC }	Map G2 into GR.
(Locking shift 2, right)	(1B, 7D hexadecimals)	-
LS3*	ESC o	Map G3 into GL.
(Locking shift 3)	(1B, 6F hexadecimals)	-
LS3R*	ESC	Map G3 into GR.
(Locking shift 3, right)	(1B, 7C hexadecimals)	

^{*} Available only in VT300 mode.

^{**} Applies only to 6400 and 5055 computers.

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Received Codes

Received codes are codes the terminal receives from an application or host computer. The following pages describe received codes, and the action taken by the terminal when it receives the codes from an application or host.

Select C1 Controls

Select C1 controls (code extension announcers) control the representation of C1 control codes returned to the application. The terminal supports select 7-bit and 8-bit C1 control transmission (Table 6-11).

NOTE:

The terminal does not support DECSCL sequences.

Table 6-11 Select C1 Controls

Transmission	Sequence	Action
Select 7-bit C1 Control (S7C1T)	ESC sp F	Converts all C1 codes returned to the application to their equivalent 7-bit code extensions.
Select 8-bit C1 Control (S8C1T) (Ignored in VT100 and ANSI modes.)	ESC sp G	Returns C1 codes to the application without converting them to their equivalent 7-bit code extensions.

Terminal Modes

A mode is one of several operating states used by the terminal. Table 6-12 lists selectable terminal modes and the action taken by the terminal in set mode and reset mode.

NOTE:

The last character of each reset mode sequence is lowercase L (6C hexadecimal).

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Table 6-12 Selectable Terminal Modes

Mode	Set Mode			
(Mnemonic)	Reset Mode	Sequence	Action	
Keyboard	Locked	CSI 2 h	Locks the keyboard for all following keystrokes.	
action (KAM)	Unlocked	CSI 2 l	Unlocks the keyboard.	
Insert/ Replace (IRM)	Insert	CSI 4 h	Selects insert mode. New display characters move old display characters to the right. Characters moved past the right margin are lost. Text moved into a protected character field is lost. If erasure mode (ERM) is reset, text moved into a protected character field is lost.	
	Replace	CSI 41	Selects replace mode. New display characters replace old display characters at the cursor position. The old character is erased.	
Send/Receive (SRM))	Off	CSI 1 2 h	Disables local echo. When the terminal sends characters to the host, the host must echo them back to the display.	
	On	CSI 1 2 l	Enables local echo. When the terminal sends characters, they are automatically sent to the display.	
Line feed/ New line (LNM)	New line	CSI 2 0 h	Causes a received LF, FF, or VT code to move the cursor to th first column of the next line. "Return" sends both a CR and an LF code.	
	Line feed	CSI 2 0 1	Causes a received LF, FF, or VT code to move cursor to the next line in the current column. "Return" sends a CR code only.	
Cursor key	Application	CSI ? 1 h	Causes cursor keys to send application control functions.	
(DECCKM)	Cursor	CSI ? 11	Causes cursor keys to send ANSI cursor control sequences.	
ANSI/VT52	(None)	(None)	Not applicable.	
(DECANM)	VT52	CSI ? 2 l	Ignored.	
Column	132 column	CSI ? 3 h	Ignored.	
(DECCOLM)	80 column	CSI ? 3 l	Selects 80 columns per line.	
Scrolling	Smooth	CSI ? 4 h	Ignored.	
(DECSCLM) Jump CSI ? 4 l Lets the terminal add		Lets the terminal add lines to the display as fast as possible.		
Screen	Reverse	CSI ? 5 h	Ignored.	
(DECSCNM)	Normal	CSI ? 5 l	Selects normal (light characters on a dark background).	
Origin	Origin	CSI ? 6 h	Ignored.	
(DECOM)	Absolute	CSI ? 6 l	Ignored.	

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Table 6-12 (Continued) Selectable Terminal Modes

Mode	Set Mode			
(Mnemonic)	Reset Mode	Sequence	Action	
Auto wrap (DECAWM)	On	CSI ? 7 h	Graphic display characters received when the cursor is at right margin appear on the next line. The display scrolls up if cursor is at end of the scrolling region.	
	Off	CSI ? 71	Graphic display characters received when cursor is at right margin replace previously displayed characters.	
Auto repeat	On	CSI ? 8 h	Ignored.	
(DECARM)	Off	CSI ? 8 1	Ignored.	
Print form feed (DECPFF)	On	CSI ? 18 h	Selects form feed (FF) as print termination character. The terminal sends this character to the printer after each print screen operation.	
	Off	CSI ? 18 l	Selects no termination character. The terminal does not send an FF to the printer after each print screen operation.	
Print extent	Full screen	CSI ? 19 h	Selects full screen to print during a print screen operation.	
(DECPEX)	Scrolling region	CSI ? 19 l	Selects scrolling region to print during a print screen operation.	
Text cursor enable	Visible	CSI ? 25 h	Makes the cursor visible.	
(DECTCEM)	Not visible	CSI ? 25 l	Makes the cursor not visible.	
Keypad	Application	ESC =	Keypad keys send application control functions.	
(DECKPAM/ DECPNM)	Numeric	ESC >	Keypad keys send characters that match the numeric, comma, period, and minus sign keys on main keypad. PF1-PF4 send control functions.	
Character set	National	CSI ? 42 h	Ignored.	
(DECNRCM)	Multinational	CSI ? 42 l	Ignored.	
Back arrow key mode	Backspace	CSI ? 6 7 h	The arrow key moves cursor back one space and deletes the character. It sends a BS character to the host.	
(DECBKM)	Delete	CSI ? 6 7 1	The arrow key deletes the character at the cursor position. It sends a DEL character to the host.	

Cursor Positioning

The cursor indicates the position where the next character appears. The terminal supports all cursor positioning sequences (Table 6-13).

NOTE:

Pn is a variable, ASCII-coded, numeric parameter.

Table 6-13 **Cursor Positioning**

Name (Mnemonic)	Sequence	Action	
Cursor up (CUU)	CSI Pn A	Moves cursor up Pn lines in the same column. Cursor stops at top margin.	
Cursor down (CUD)	CSI Pn B	Moves cursor down Pn lines in the same column. Cursor stops at bottom margin.	
Cursor forward (CUF)	CSI Pn C	Moves cursor right Pn columns. Cursor stops at right margin.	
Cursor backward (CUB)	CSI Pn D	Moves cursor left Pn columns. Cursor stops at left margin.	
Cursor position (CUP)	CSI Pl ; Pc H	Moves cursor to Line P1, Column Pc.	
Horizontal and vertical positions (HVP)	CSI Pl ; Pc f	Moves cursor to Line P1, Column Pc.	
Index (IND)	ESC D	Is an 8-bit control character (84 hexadecimal) that can be expressed as an escape sequence for a 7-bit environment. IND moves the cursor down one line in the same column. If cursor is at bottom margin, display scrolls up.	
Reverse index (RI)	ESC M	Is an 8-bit control character (8D hexadecimal) that can be expressed as an escape sequence for a 7-bit environment. RI moves the cursor up one line in the same column. If the cursor is at top margin, the display scrolls down.	
Next line (NEL)	ESC E	Is an 8-bit control character (85 hexadecimal) that can be expressed as an escape sequence for a 7-bit environment. NEL moves the cursor to the first position on the next line. If the cursor is at bottom margin, the display scrolls up.	
Save cursor (DECSC)	ESC 7	Saves the following into memory: cursor position, graphic rendition, character set shift state, state of wrap flag, state of origin mode, state of selective erase.	
Restore cursor (DECRC)	ESC 8	Restores the states described for DECSC. If none of these characteristics were saved the cursor moves to home position, origin mode is reset, no character attributes are assigned, and the default character set mapping is established.	

Tab Stops

Tab stops are selected based on the vertical column of the display. When the terminal receives a horizontal tab code (HT, 09 hexadecimal), the cursor tabs to the next tab stop. If no tab stops exist, the cursor tabs to the right margin.

The terminal supports both tab stop sequences (Table 6-14). The terminal supports "global" line tab stops only. It does not allow tab set and clear on every character on every line as for a VT/ANSI.

Table 6-14 Tab Stops

Name (Mnemonic)	Sequence	Action
Horizontal tab set (HTS)	ESC H	Sets a tab stop at the current column. HTS is an 8-bit control character (88 hexadecimal) that can also be expressed as an escape sequence when coding for a 7-bit environment.
Tabulation clear	CSI g	Clears a horizontal tab stop at cursor position.
(TBC)	$\operatorname{CSI} 0 \ \mathrm{g}$	Clears a horizontal tab stop at cursor position.
	CSI 3 g	Clears horizontal tab stops.

Character Rendition and Attributes

Character rendition and attributes affect how a character is displayed, without changing the character. Select graphic rendition sequences change character rendition. The select character attribute sequence designates characters as erasable or non-erasable.

Select Graphic Rendition (SGR)

Table 6-15 lists select graphic rendition sequences and the action the terminal takes.

Table 6-15 Select Graphic Rendition

Graphic Rendition	Sequence and Ps (Single Parameter)	Action
All attributes off	CSI 0 m	Turns all attributes off.
Display bold	CSI 1 m	Translates bold to reverse video.
Display underscored	CSI 4 m	Displays underscored.
Display blinking	CSI 5 m	Ignored.
Display negative (reverse) image	CSI 7 m	Displays negative (reverse) image.
Display normal intensity	CSI 2 2 m	Displays normal intensity.
Display not underlined	CSI 2 4 m	Displays not underlined.
Display not blinking	CSI 2 5 m	Ignored.
Display positive image	CSI 2 7 m	Displays positive image.

Select Character Attributes (DECSCA)

The terminal ignores select character attributes (Table 6-16).

Table 6-16
Select Character Attributes

Character Attribute	Sequence and Ps	Action
All attributes off	CSI 0 " q	Ignored.
Designate characters as non-erasable by DECSEL/DECSED	CSI 1 " q	Ignored.
Designate character as erasable by DECSEL/DECSED	CSI 2 $^{\prime\prime}$ q	Ignored.

Line Attributes

Line attributes affect an entire display line. The cursor selects the line affected by the attribute. It stays in the same character position when the attribute changes, unless the attribute would move the cursor past the right margin. In this case, the cursor stops at the right margin. When scrolling, the attribute moves with the line.

Double-height line sequences make the line with the cursor the top or bottom half of a double-height, double-width line. The terminal ignores these sequences (Table 6-17).

Table 6-17 **Double-Height Line**

Line Attribute	Half	Sequence	Action
Double-height, double-width	Top	ESC # 3	Ignored.
	Bottom	ESC # 4	Ignored.

The terminal supports the single-width line (Table 6-18).

Table 6-18 **Single-Width Line**

Line Attribute	Sequence	Action
Single-width, single-height	ESC # 5	Makes the line with the cursor single-width, single-height. This is the line attribute for all new lines on the display.

Double-width line makes the line with the cursor double-width, single-height. The terminal ignores this sequence (Table 6-19).

Table 6-19	
Double-Width Line	

Line Attribute	Sequence	Action
Double-width, single-height	ESC # 6	Ignored.

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Erasure Mode

Erasure mode (ERM) determines whether erasing functions (ECH, erase character; EL, erase in line; and ED, erase in display) can edit protected characters. Table 6-20 lists erasure mode sequences.

NOTE:

In edit mode (DECEDM), ERM affects editing functions IL, DL, ICH, and DCH.

Table (6-20
Erasure	Mode

Mode	Sequence	Comments
Set	CSI 6 h	Erasing functions ECH, EL, and ED can affect all protected and unprotected characters.
Reset	CSI 6 l	Erasing functions ECH, EL, and ED can affect only unprotected characters.

Table 6-21 lists the erasing and editing functions that ERM affects. ERM also affects the independent style of character protection.

Table 6-21
Control Functions Affected by Character Protection

Always Affected	Affected if Edit Mode (DECEDM) is Set
Erase character (ECH)	Insert character (ICH)
Erase in line (EL)	Insert line (IL)
Erase in display (ED)	Delete character (DCH) Delete line (DL)

Editing

Editing sequences insert and delete characters and lines of characters at the cursor position. The position does not change when lines are inserted or deleted. The terminal supports all editing sequences (Table 6-22).

NOTE:

Pn is a variable, ASCII-coded, numeric parameter.

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Table 6-22 **Editing**

Name (Mnemonic)	Sequence	Action
Insert line (IL)	CSI Pn L	Inserts Pn lines at the cursor. If fewer than Pn lines remain from the current line to the end of the scrolling region, the number of lines inserted is the lesser number. Lines within the scrolling region at and below the cursor move down. Lines moved past bottom margin are lost. The cursor is reset to the first column. This sequence is ignored when the cursor is outside the scrolling region. In edit mode (DECEDM), if erasure mode (ERM) is reset, lines that move down into a
D 1 / 1'	COLD M	line with a protected character field are lost.
Delete line (DL)	CSI Pn M	Deletes Pn lines, starting at the line with the cursor. If fewer than Pn lines remain from the current line to the end of the scrolling region, the number of lines deleted is the lesser number. As lines are deleted, the lines within the scrolling region and below the cursor move up, and blank lines are added at the bottom of the scrolling region. The cursor is reset to the first column. This sequence is ignored when the cursor is outside the scrolling region. In edit mode (DECEDM), if erasure mode (ERM) is reset, DL cannot delete lines that have protected characters. As lines are deleted, the area moved up is bounded by the bottom of the scrolling region, or by the next line with a protected character field.
Insert characters (ICH) (Applies only to ANSI, VT220, VT320, and VT340 modes. Is ignored in VT100 mode.)	CSI Pn @	Inserts Pn blank characters at the cursor position, with the character attributes set to normal. The cursor does not move and remains at the beginning of the inserted blank characters. A parameter of 0 or 1 inserts one blank character. Data on the line is shifted forward as in character insertion. In edit mode (DECEDM), if erasure mode (ERM) is reset, text moved into a protected character field is lost.
Delete character (DCH)	CSI Pn P	Deletes Pn characters, starting with the character at the cursor position. When a character is deleted, all characters to the right of the cursor move to the left. This creates a space character at the right margin for each character deleted. Character attributes move with the characters. Spaces created at the end of the line have all of their character attributes off. In edit mode (DECEDM), if erasure mode (ERM) is reset, DCH cannot delete protected characters.

Erasing

Erasing deletes characters in the terminal's display without affecting other characters. Erased characters are lost. Cursor positioning does not change when characters or lines are erased. Table 6-23 lists erasing sequences and the action taken by the terminal.

 $Table\ 6\text{-}23$ Erasing

Name (Mnemonic)	Sequence	Action
Erase character (ECH) (Applies only to ANSI, VT220, VT320, and VT340 modes. Is ignored in VT100 mode.)	CSI Pn X	Erases characters at the cursor position and the next Pn-1 character. A parameter of 0 or 1 erases a single character. Character attributes are set to normal. No reformatting of data on the line occurs. The cursor remains in the same position.
		If erasure mode (ERM) is reset, ECH cannot erase protected characters.
Erase in line (EL)	CSI K	Erases from the cursor to the end of the line, including the cursor position. Line attribute is not affected. If erasure mode (ERM) is reset, EL cannot erase protected characters.
	CSI 0 K	Same as CSI K.
	CSI l K	Erases from the beginning of the line to the cursor, including the cursor position. Line attribute is not affected.
	$\mathrm{CSI}\ 2\ \mathrm{K}$	Erases the complete line.
Erase in display (ED)	CSI J	Erases from cursor to the end of display, including the cursor position. Line attribute is single-height, single-width for all completely erased lines.
		If erasure mode (ERM) is set, ED cannot erase protected character positions.
Erase in display	$\mathrm{CSI}\ 0\ \mathrm{J}$	Same as CSI J.
(ED)	CSI 1 J	Erases from the beginning of the display to the cursor, including the cursor position. Line attribute becomes single-height, single-width for all completely erased lines.
	CSI 2 J	Erases complete display. All lines are erased and changed to single-width. The cursor does not move.
Selective erase in line (DECSEL)	CSI ? K CSI ? 0 K CSI ? 1 K CSI ? 2 K	Ignored by the terminal.
Selective erase in display (DECSED)	CSI ? J CSI ? 0 J CSI ? 1 J CSI ? 2 J	Ignored by the terminal.

Scrolling Margins (Top and Bottom)

The scrolling region is the area of the terminal's display that can receive new characters by scrolling old characters off the display. The area is defined by the top and bottom display margins (Table 6-24). The smallest scrolling region allowed is two lines. The number of the top margin must be at least one less than the number of the bottom margin.

Table 6-24 Scrolling Margins (Top and Bottom)

Name (Mnemonic)	Sequence	Action
Set top and bottom margins (DECSTBM)	CSI Pt ; Pb r	Sets top and bottom scrolling margins. The value of Pt must be less than Pb. Moves the cursor to Column 1, Line 1 of the page.

Printing

Select print operations (Table 6-25) with control sequences. When characters are printed on the screen, printer tab stops are ignored. Print characters are spaced with the SP character. The terminal sends a carriage return and line feed, vertical tab, or form feed after the last printable character on a line (not a space character).

NOTE:

The terminal ignores printer port DSR exchanges.

Table 6-25 **Printing**

Name	Sequence	Action
Auto print mode	CSI ? 5 i	Turns on auto print mode. Display lines print when you move the cursor off the line with a line feed, form feed, vertical tab, or auto wrap. The printed line ends with a carriage return and the character that moved the cursor off the previous line (LF, FF, or VT). Auto wrap lines end with a line feed.
	CSI ? 4 i	Turns off auto print mode.
Printer controller	CSI 5 i	Turns on printer controller mode. The terminal sends received characters to the printer without displaying them on the screen. All characters and character sequences except NUL, XON, XOFF, CSI 5 i, and CSI 4 i are sent to the printer. The terminal does not insert or delete spaces, provide line delimiters, or select the correct printer character set. Keyboard activity is still directed to the host.
	CSI 4 i	Turns off printer controller mode.
Print cursor line	CSI?li	Prints the data on the display line with the cursor. Cursor position does not change. Print-cursor-line sequence is complete when the line prints. No CR/LF is attached to the line.
Print screen	CSI i	Prints the screen display (full screen or scrolling region, depending on the print extent DECPEX selection). Printer form feed mode (DECPFF) selects either a form feed (FF) or nothing as the print terminator. Print screen sequence is complete when the screen prints.
	CSI 0 i	Same as CSI i.

User-Defined Keys (DECUDK)

NOTE:

The DECUDK command is ignored in VT100 mode.

The terminal has 20 user-defined keys (UDKs). You can define the codes of 15 of these keys. The keys are:

- ▶ F6 through F14
- ► F15 (Help)
- ► F16 (Do)
- ► F17 through F20

Use UDKs to store and recall text and commands that you often use with applications. You should refer to your application's software manual for the commands you can store in user-defined keys.

If you use dual sessions, you can define UDKs for each session. However, you can only save one set of UDK definitions. For each session you can use a total of 256 characters to define UDKs.

Using UDKs

To enter definitions for the 15 UDKs, you program the definitions with DECUDK device control strings. To use a UDK after you have defined it, the terminal must be in caps lock mode. For example, if you defined the F6 key, you can use it by pressing the caps lock key for the terminal and then the key sequence for the F6 key. The following chart shows key combinations for caps lock.

Terminal	Key Sequence
2415	① (55-key keyboard)
	① ③ (37-key numeric keyboard)
	(37-key function numeric keyboard)
2425	f Z
2455	f Z
248X	f n

NOTE:

The host system can also define the function keys.

UDK Memory Space

There are 256 bytes of memory space available for the 15 UDKs. Space is supplied on a first come, first serve basis. When the 256 bytes are full you cannot define any more keys until you clear some of the memory space. Three ways that you can clear space are:

- ▶ Redefine one or more UDKs by using a DECUDK control string.
- ▶ Clear one or more UDKs by using a DECUDK control string.
- ► Clear all UDKs with a terminal power-up or hard terminal reset (RIS) operation.

NOTE:

All UDK key definitions are lost when terminal power is lost.

Programming UDKs

Use the following device control string format to down-line load definitions for UDKs.

DCS	Pc; Pl		Ky1/St1;Kyn/Stn	ST
Device control string introducer	Clear and lock parameters	Final character	Key definition string	String terminator

DCS indicates the beginning of a device control string. DCS is an 8-bit C1 character (90 hexadecimal). You can use ESC P (1B and 50 hexadecimals) for a 7-bit environment.

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> **Pc** is the clear parameter that selects how to clear key definitions. The following chart summarizes Pc values and meanings.

\mathbf{Pc}	Meaning
0 (default) or none	Clear all keys before loading new values.
1	Clear one key at a time, before loading a new value.

When Pc is 1, the terminal only clears the keys you are loading. By using a Pc value of 1, you can redefine some keys without redefining them all.

NOTE:

There are 256 bytes of memory for all UDKs. A key definition can only use the number of bytes available when that key is loaded.

If Pc is 1, a key load may fail because no memory space is available. The reason for this is, with Pc set to 1, keys are cleared and loaded sequentially. If the new definition for a key is larger than the old one you may exceed the 256-byte limit.

For example, suppose F6 contains 120 bytes, F7 contains 110 bytes, and F8 contains 20 bytes. You try to load F8 with 40 bytes, F6 with 1 byte, and F7 with 1 byte, in that order. This works if all keys are cleared first (Pc is 0), but not if keys are cleared one at a time (Pc is 1). When you try to load F8 with 40 bytes, the load fails because only 26 bytes are free at that time. (256 maximum — 120 in F6 - 110 in F7 = 26.)

Pl is the lock parameter. Pl determines whether the key definitions are locked or unlocked after you load them. The following chart summarizes Pl values and meanings.

Pl	Meaning
0	Lock the keys. If you want to load new values into the keys, you must unlock the keys through the terminal's firmware menus.
1 (default) or none	Do not lock the keys. The keys are unlocked and can be redefined with another DECUDK string.

NOTE:

If PI is 1 and the keys are already locked, nothing happens.

NOTE:

The terminal ignores UDK DSR exchanges.

The terminal uses a special lock to allow or prevent the programming of UDKs. You can turn on this lock through the terminal's firmware menus or from the host (with a DECUDK device control string). The lock affects all programmable keys. When using the lock follow these guidelines:

- ▶ Unlock the keys to define them. The keys must be unlocked before you can define them. You can only unlock the keys through the terminal's firmware menus. If a key is locked and an application tries to redefine the key with a DECUDK sequence, the terminal ignores the sequence.
- ▶ Lock the keys to prevent redefinition. You can lock the keys through the terminal's firmware menus or from the host (with a DECUDK sequence). New key definitions are unlocked by default.

The **vertical bar** (|, 7C hexadecimal) is the final character. It identifies this control string as a DECUDK.

> **Ky1/St1**;...**Kyn/Stn** are the key definition strings. You include these strings between the final character (|) and the string terminator (ST). Each string consists of a key selector number (Kyn) and a string parameter (Stn), separated by a slash (/, 2F hexadecimal). A semicolon (3B hexadecimal) separates different strings.

The key selector number (Kyn) indicates which key you are defining. Following is a list of definable keys and their identifying values.

Key	Value
F6	17
F7	18
F8	19
F9	20
F10	21
F11	23
F12	24
F13	25
F14	26
Help	28
Do	29
F17	31
F18	32
F19	33
F20	34

String parameters (Stn) are the encoded definition of the keys. String parameters consist of hex pairs in the following ranges:

- ▶ 30 through 39 hexadecimal (0 through 9)
- ▶ 41 through 46 hexadecimal (A through F)
- ▶ 61 through 66 hexadecimal (a through f)

When you combine these hexadecimal values they represent an 8-bit quantity. This method lets you use any of the 256 character codes in the key string. You can enter key definition strings in any order.

The default for Stn is "empty." The key is undefined.

ST is the string terminator. ST (9C hexadecimal) is a C1 8-bit character. You can use ESC \ (1B and 5C hexadecimals) for a 7-bit environment.

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Loading UDKs

Following are some guidelines for loading UDKs.

- ▶ Clear UDK memory space before loading new definitions. Use a DECUDK string to clear keys without locking them. Then you can use another DECUDK string to redefine the keys and lock them.
- ▶ If you redefine a key, the old definition is lost. This may clear some space if the new definition uses fewer bytes than the old one.
- ▶ There are two ways to lock UDKs, but only one way to unlock them. To lock UDKs, you can use either the terminal's firmware menus or a DECUDK control string. To unlock UDKs, you must use the terminal's firmware menus.
- ▶ The default value for each key definition is empty. When you clear UDKs, they are empty.
- ▶ An invalid hex pair in a DECUDK string is ignored.

Examples of Device Control Strings

This sequence clears UDKs:

```
DCS 0 ; 1 | ST
```

This sequence locks UDKs:

```
DCS 1 ; 0 | ST
```

Suppose you want to define the F20 key to be PRINT without clearing or locking any other keys and you are using 8-bit mode. The first part of the sequence would look like this:

```
É1;1|34/
```

where 34 is the code for the F20 key and "É" is the ASCII character for 90 hexadecimal.

After the slash character "/" (2F hexadecimal) you would include the definition. The rest of the sequence after the slash character would be,

5052494E54£

where the hex encoding for PRINT is:

50 = P

52 = R

49 = I

4E = N

54 = T

The ST ASCII character "£" (9C hexadecimal) marks the end of the control string. The complete string is:

É1;1|34/5052494E54£

Down-Line Loadable Character Set

The terminal does not support the ability to create and down-line load a character set of up to 94 characters (Table 6-26). This character set is also called a dynamically redefinable character set (DRCS).

Table 6-26 Down-Line Loadable Character Set

Function	Action
Down-line load DRCS characters	Ignored.
Clear a down-line loaded character set	Ignored.

Reports

The terminal sends reports in response to host computer requests. Reports provide identification (type of terminal). Two categories of reports are available: primary and secondary device attributes, and device status reports.

Device Attributes (DA)

Table 6-27 shows the action taken by the terminal when it receives primary and secondary device attribute exchanges. During a primary exchange, the host asks for the terminal's service class code. The terminal responds with "I am a service class 2 terminal." During a secondary exchange the terminal responds with "I am a VT (identification code of 1) family terminal."

Table 6-27 **Device Attributes**

Communica- tion	DA Exchange	Sequence	Meaning
Host to VT220	Primary	$CSI > c \ or \ CSI > 0 \ c$	What type of terminal are you?
(request)	Secondary	CSI c or CSI 0 c	What type of terminal are you?
VT220 to host	Primary	CSI > c	I am a VT100 terminal.
(response)		CSI > 1 c	I am a VT220 terminal.
		CSI > 24 c	I am a VT320 terminal.
		CSI > 19 c	I am a VT100 terminal.
	Secondary	CSI ? 61 c	I am a VT100 terminal.
		CSI ? 62 ; 8 ; 9 c	I am a VT220 terminal supporting user-defined keys and national replacement character sets.
		CSI ? 63 ; 8 ; 9 c	I am a VT320 terminal supporting user-defined keys and national replacement character sets.
		CSI ? 63 ; 8 ; 9 ; 13 c	I am a VT340 terminal supporting user-defined keys, national replacement character sets, and local editing.

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Device Status Reports (DSR)

Table 6-28 shows the action taken by the terminal when it receives device status report exchanges, when the host computer asks for the general operating status of the terminal or printer, or both. If the terminal is in printer controller mode, the printer receives the DSR request but cannot answer.

Table 6-28

Device Status Reports

DSR Exchange	Communication	Sequence	Action
VT220	Host to VT220 (Request for status)	CSI 5 n	Ignores this code.
	VT220 to host (DA response)	CSI 0 n or CSI 3 n	Ignores these codes.
	Host to VT220 (Request for cursor position)	CSI 6 n	"Please report your cursor position using a CPR (not DSR) control sequence."
	VT220 to host (CPR response)	CSI Pv; Ph R	"My cursor is positioned at (Pv); (Ph)." (Pv=row, Ph=column)
Printer port	Request for printer status	CSI ? 15 n	What is the printer status?
	Response	CSI ? 13 n	No printer.
User-defined keys	Request for UDK status	CSI ? 25 n	Ignored in VT100 mode.
v	Response	CSI ? 20 n	UDKs are unlocked.
		CSI ? 21 n	UDKs are locked.
Keyboard language	Request for keyboard language	CSI ? 26 n	What is the keyboard language?
	Response	CSI ? 27; Pn n	North American keyboard dialect.

Identification

The terminal supports the identification sequence (Table 6-29).

Table 6-29 Identification

Name (Mnemonic)	Sequence	Action
Identification (DECID)	ESC Z	Ignored.

Terminal Reset

Terminal reset escape sequences cause either a soft terminal reset or a hard terminal reset.

Soft Terminal Reset (DECSTR)

NOTE:

The DECSTR control function is available for all VT/ANSI modes.

DECSTR changes most of the terminal's current settings to the power-up default settings listed in Table 6-30. The escape sequence is:

DECSTR affects only those functions listed in Table 6-30.

Table 6-30 Soft Terminal Reset (DECSTR) States

Mode	Mnemonic	State After DECSTR
Text cursor enable	DECTCEM	Cursor enabled.
Insert/replace	IRM	Replace. ("Insert" if local editing mode.)
Origin	DECOM	Absolute (cursor origin at upper-left of screen).
Auto wrap	DECAWM	No auto wrap.
Keyboard action	KAM	Unlocked.
Numeric Keypad	DECNKM	Numeric characters.
Cursor keys	DECCKM	Normal (arrow keys).
Edit	DECEDM	Interactive.
Transmit execution	DECTEM	Immediate.
Erasure	ERM	All characters.
Guarded area transfer	GATM	All characters.
Multiple area transfer	MATM	All selected areas.
Selected area transfer	SATM	All areas.
Scanner lock		Reset.

Table 6-31 lists other control functions.

Table 6-31 Other Control Functions

Mode	Mnemonic	State After DECSTR
Set top and bottom margins	DECSTBM	Top margin = 1. Bottom margin = page length.
All character sets	G0, G1, G2, G3, GL, GR	VT/ANSI default settings.
Select graphic rendition	SGR	Normal rendition.
Start of selected area	SSA	Cleared.
End of selected area	ESA	Cleared.
Start of protected area	SPA	Cleared.
End of protected area	EPA	Cleared.
Save cursor state	DECSC	Home position with VT/ANSI defaults.

All tab stops are reset. User-defined keys are cleared.

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Hard Terminal Reset (RIS)

When the RIS is complete, the terminal sends XON to resume communication.

The RIS sequence is:

ESC c

RIS resets values to factory default settings. It is the same as DECSTR, but also does the following:

- ▶ Clears the screen.
- ▶ Returns cursor to the upper-left corner of the screen.
- ▶ Sets SGR function to normal rendition.

Tests and Adjustments

The terminal has adjustment patterns you can invoke from the host computer with escape sequences. Adjustment sequences send uppercase E's to the terminal's display. Only qualified technicians perform adjustment procedures.

Table 6-32 shows the action taken by the terminal when it receives test and adjustment sequences.

Table 6-32 **Tests and Adjustments**

Name (Mnemonic)	Sequence	Action
Tests (DECTST)	CSI 4; Ps;; Ps y	Ignored.
Adjustments (DECALN)	ESC # 8	Fills display with uppercase E's.

VT52 Mode Escape Sequence

The terminal does not support VT52 mode, which allows the VT/ANSI terminal to operate with DEC software written for VT52 terminals.

Define Area Qualification

The define area qualification (DAQ) command indicates that the active position is the first character position of a qualified area. The end of a qualified area is indicated by the beginning of the following qualified area. The qualifications of the area are specified according to the parameter(s). Table 6-33 lists qualification sequences.

NOTE:

DAQ is ignored unless the terminal is in VT340 mode.

Table 6-33

Define Area Qualification

Qualification	Sequence and Ps (Single Parameter)	Action
Accept all input	CSI 0 o	Accepts all input.
Accept no input (protected) and do not transmit (guarded)	CSI 1 o	Accepts no input.
Accept graphics	CSI 2 o	Accepts graphics.
Accept numerics	CSI 3 o	Accepts numerics.
Accept alphabetics	CSI 4 o	Accepts alphabetics.
Right justify in area	CSI 5 o	Right justifies area.
Zero fill in area	CSI 6 o	Fills area with zeroes.
Horizontal tab stop at start of area	CSI 7 o	Places a horizontal tab stop at start of area.
Accept no input (protected), but select for transmission (unguarded)	CSI 8 o	Accepts no input.
Space fill in area	CSI 9 o	Fills area with spaces.
Invisible	CSI 1 0 o	Makes passwords invisible.

Private Sequences

Private sequences enable or disable autosend (Table 6-34).

Table 6-34 Private Sequence

Mode	Sequence*	Action
Set	ESC [= 3 l	Enables autosend. Transmits the screen when the last field is filled. If you are on the last defined field and get data from the bar code reader or RS-232 port, the display will also be automatically sent even if the field not filled.
Reset	ESC [= 3 h	Disables autosend. Only transmits when a terminating key is pressed.

^{*} The last character of the set mode sequence is lowercase L (6C hexadecimal).

Proprietary Sequences

Following are INTERMEC® extensions to the data stream.

Line Edit and Character Modes

Two proprietary escape sequences enable the host to put the terminal into Line Edit (block) mode or Character mode (Table 6-35). Note that the terminal enters Character mode when it is cold-started.

Table 6-35 Line Edit and Character Mode Sequences

Mode	Sequence*	
Line Edit	CSI = 1 l	
Character	CSI = 1 h	

^{*} The last character of the Line Edit sequence is lowercase L (6C hexadecimal).

Norcompress

The Norcompress function handles the norrc command, where "a" is the number of iterations that "b" occurs in the datastream. The sequence for Norcompress is CSI a;bz.

Scanner Lock Mode

Scanner lock mode is similar to the KAM function; however, you do not need to repeatedly send the Locked command (this command is assumed after each scan).

Table 6-36 Scanner Lock Mode

Mode	Sequence*	Action
Set	CSI = 4 h	The host sends this sequence, which puts the terminal into Scanner Lock mode. When the terminal is in this mode, only one scan is allowed; the scanner is then inhibited. After this sequence is sent, the user can scan only once (no additional scans are allowed). To re-enable the scanner, the host must send CSI 2 l to unlock the scanner.
Reset	CSI = 4 l	Resets Scanner Lock mode (default).

^{*} The last character of the reset sequence is lowercase L (6C hexadecimal).

The scanner lock state can also be reset by the RIS command (ESC c) or the DECSTR command (CSI ! p).

VT330/VT340 Applications

VT330/VT340 terminal applications supported by the terminal include setting the right margin, using control functions, and creating text forms.

Right Margin

The terminal's display contains 2 to 80 columns. To ensure that the cursor will not go beyond Column Pn, use the following sequence to set the number of columns (Pn is a number from 2 to 80):

CSI Pn \$ ¦

Control Functions

In editing mode you can use the erasure, deletion, and insertion control functions. The character protection field lets you design text forms that cannot be changed or overwritten. In edit mode, character protection also depends on the setting of erasure mode (ERM):

- ▶ If ERM is set all characters can be changed, erased, and moved, regardless of protection.
- If ERM is reset only unprotected characters can be changed, erased, and moved. These control functions will not affect protected areas in page memory:

Insert line (IL) Delete line (DL) Insert character (ICH) Delete character (DCH) Erase in display (ED) Erase in line (EL) Erase character (ECH)

Text Forms

When using C1 control characters SPA, EPA, SSA, and ESA to create forms on the host, the rows and columns to which the cursor moves must be in sequential order. The following example shows some sequences that create a text form.

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Sequence	Description
ESC [1; 1 H	Home cursor.
ESC [2 J	Clear screen.
ESC [? 10 h	Start local editing mode.
ESC V	Start protected area.
ESC [1 ; 2 H	Move cursor to Row 1, Column 2.
ESC [1; 17 H	Move cursor to Row 1, Column 17.
"Manufacturing"	Display literal.
"Receiving"	Display literal.
ESC [2; 1 H	Move cursor to Row 2, Column 1.
"LIP:"	Display literal.
ESC [1 D	Move cursor back one position.
ESC W	End protected area.
ESC [1 C	Move cursor forward one position.
ESC F	Start selected area.
ESC [2; 15 H	Move cursor to Row 2, Column 15.
ESC G	End selected area.
ESC V	Start protected area.
ESC [3; 1 H	Move cursor to Row 3, Column 1.
"Item:"	Display literal.
ESC [1 D	Move cursor back one position.
ESC W	End protected area.
ESC [1 C	Move cursor forward one position.
ESC F	Start selected area.
ESC [3; 16 H	Move cursor to Row 3, Column 16.
ESC G	End selected area.
ESC V	Start protected area.
ESC [4; 1 H	Move cursor to Row 4, Column 1.
"Lot:"	Display literal.
ESC [1 D	Move cursor back one position.
ESC W	End protected area.
ESC [1 C	Move cursor forward one position.
ESC F	Start selected area.
ESC [4; 9 H	Move cursor to Row 4, Column 9.
ESC G	End selected area.
ESC V	Start protected area.
ESC [5; 1 H	Move cursor to Row 5, Column 1.
"Qty:"	Display literal.
ESC [1 D	Move cursor back one position.
ESC W	End protected area.

(Continued)

Sequence	Description
ESC [1 C	Move cursor forward one position.
ESC F	Start selected area.
ESC [5; 13 H	Move cursor to Row 5, Column 13.
ESC G	End selected area.
ESC V	Start protected area.
ESC [24; 80 H	Move cursor to Row 24, Column 80.
ESC W	End protected area.
ESC [26 \$	Set the number of columns to 26.
ESC [1; 8 r	Set top at 1, bottom at 8 rows.
ESC [3 g	Clear tab stops.
ESC [2; 5 H	Move cursor to Row 2, Column 5.

If this information is entered on the form:

11111111	for "LIP:"
222222222	for "Item:"
3333	for "Lot:"
4444444	for "Qty:"

The data stream will be sent to the host as indicated in the following chart. (If guarded area transfer mode (GATM) is reset, then the record separator is processed as a protected field entry.)

Sequence	Description
RS	Protected field Line 1.
RS	First protected field Line 2.
111111111	Selected field Line 2.
RS	Second protected field Line 2.
RS	First protected field Line 3.
222222222	Selected field Line 3.
RS	Second protected field Line 3.
RS	First protected field Line 4.
3333	Selected field Line 4.
RS	Second protected field Line 4.
RS	First protected field Line 5.
4444444	Selected field Line 5.
RS	Second protected field Line 5.
RS	Protected field Line 6.
RS	Protected field Line 7.
RS	Protected field Line 8.

ANSI Mode Sequences

Cursor Positioning

The terminal supports the cursor positioning sequences in Table 6-37.

Table 6-37 **Cursor Positioning Sequences**

·		g coqueco
Name (Mnemonic)	Sequence	Action
Cursor backward tab (CVT)	CSI Ps Z	Moves the cursor to previous Ps tab stop(s). If there is no previous tab stop, then the cursor moves to the left margin.
Cursor horizontal absolute (CHA)	CSI Ps G	Moves the cursor to the Ps column on the current line.
Cursor horizontal tab (CHT)	CSI Ps I	Moves the cursor to the next Ps tab stop(s). If there is not next tab stop, then the cursor moves to the right margin.
Cursor next line (CNL)	CSI Ps E	Moves the cursor down Ps lines. If at the bottom margin of the screen, then the cursor is not moved.
Cursor previous line (CPL)	CSI Ps F	Moves the cursor up Ps lines. If at the top margin of the screen, then the cursor is not moved.
Horizontal position absolute (HPA)	CSI Ps	Moves the cursor to Ps column on the current line.
Horizontal position relative (HPR)	CSI Ps a	Moves the cursor Ps columns from the current location. If past the right margin, then the cursor is stopped at the right margin.
Vertical position absolute (VPA)	CSI Ps d	Moves the cursor to Ps row using the current column.
Vertical position relative (VPR)	CSI Ps e	Moves the cursor Ps rows from the current location. If at the bottom margin, then the cursor is stopped at the bottom margin.
Cursor vertical tab (CVT)	CSI Ps Y	Moves the cursor down Ps vertical tab stops. If at the bottom margin, then the cursor is stopped.

Cursor Tabulation Control

Table 6-38 lists cursor tabulation control (CBT) sequences in ANSI mode.

Table 6-38 **Cursor Tabulation Control Sequences**

Sequence	Action
CSI 0 W	Sets horizontal tab stop at current location.
CSI 1 W	Sets vertical tab stop at current location.
CSI 2 W	Clears horizontal tab stop.
CSI 3 W	Clears vertical tab stop.
CSI 4 W	Clears all horizontal tab stops this line.
CSI 5 W	Clears all horizontal tabs stops in the machine.
CSI 6 W	Clears all vertical tab stops

Scrolling

Table 6-39 lists scrolling sequences in ANSI mode.

Table 6-39 Scrolling Sequences

Name (Mnemonic)	Sequence	Action
Scroll up (SU)	CSI Ps S	Scrolls display up Ps lines.
Scroll down (SD)	CSI Ps T	Scrolls display down Ps lines.

Transmitted Keyboard Codes

Transmitted codes are codes generated by the terminal's keys and sent to the host computer or software application in use. The following pages describe the capability of the terminals to emulate codes generated by the VT/ANSI terminal keyboard's main keypad, editing keypad, auxiliary keypad, and top-row function keys.

Codes are sent via Line Edit (block) mode or optimized Character mode selected through the keyboard function labeled MODE on the overlay.

Line Edit (Block) Mode

Line Edit (block) mode is a synchronous condition where the terminal temporarily stores or "buffers" keys you press. It sends the cumulative data to the host computer when you press one of the following terminating keys:

[ENTER]

[F6] through [F20], [PF1] through [PF4] [CTRL]+[A] through [CTRL]+[Z] Forward Tab

DEL (7F hexadecimal)

Backspace

The following also apply to Line Edit (block) mode:

- ▶ When you press [PF1], the following key will also be transmitted directly to the host computer.
- ▶ When scanning, the terminal automatically enters Line Edit (block) mode for each individual scan. When it completes scanning, it returns to the mode it was set at before it started scanning.

For codes generated by the cursor control key, see page 6-41. For codes generated by the keypad keys, see page 6-42.

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Character Mode

Character mode (the default) is a condition where the terminal sends, to the host computer, each key as you press it. You should place the terminal into Character mode during these situations:

- ▶ When the terminal should immediately send information to the host computer. This operation is called "type-ahead."
- ▶ When the terminal's keyboard sends a character to the display as well as to the host. This operation is called "local echo." If local echo is disabled, the host receives the character from the terminal and then sends the return response.

To alternate between Line Edit (block) mode and Character mode, press the sequence of keys listed in Section 3, "Using the Terminal's Keyboard."

Transmitted Keyboard Keys

The following pages describe codes generated by main keypad keys, editing keys, auxiliary keys, and top-row function keys.

Main Keypad

The terminal emulates all of the standard and most of the special function keys on the VT/ANSI main keypad. The standard keys generate letters, numbers, and symbols, either alone or in combination with other keys. The function keys generate special function codes.

Table 6-40 lists the codes generated by the special function keys.

Table 6-40 Special Function Keys and Codes Generated

VT/ANSI Key	Code
Ctrl	Does not send a code when used alone. Is always used in combination with another key to send a control code.
Delete	DEL (7F hexadecimal).
Lock	None.
Return	CR (0D hexadecimal) or CR (0D hexadecimal) LF (0A hexadecimal).
Shift	Does not send a code when used alone; sends uppercase characters when used with other standard keys.
Space bar	SP (20 hexadecimal).
Tab	HT (09 hexadecimal).

Editing Keypad

The terminal has editing keys and cursor control keys. Editing keys have functions assigned to them by the application software in use. Refer to your VT/ANSI application software manual for the uses of the editing keys.

Editing Keys

Table 6-41 lists the codes generated by the editing keys.

NOTE:

The editing keys do not send codes in VT100 mode.

Table 6-41 Editing Keys and Codes Generated

VT/ANSI Key	Code
Find	CSI 1 ~
Insert here	CSI 2 ~
Next screen	CSI 6 ~
Prev screen	CSI 5 ~
Remove	CSI 3 ~
Select	CSI 4 ~

Cursor Keys

Table 6-42 lists codes generated by the terminals' cursor keys.

Table 6-42 Cursor Keys and Codes Generated

Key	Cursor Key Mode Reset (Normal)	Cursor Key Mode Set (Application)
Down arrow	CSI B	SS3 B
Left arrow	CSI D	SS3 D
Right arrow	CSI C	SS3 C
Up arrow	CSI A	SS3 A

Sending Host Cursor Keys

In keyboard unshifted and shifted modes, the cursor control key sends a host cursor key to the host computer. The cursor control key emulates the arrow keys of a VT/ANSI terminal in either their normal arrow key mode or Application mode, depending on the state set by the programmer.

To Send	Press Terminal Key(s)
Host cursor down key	[▼]
Host cursor left key	[◀]
Host cursor right key	[>]
Host cursor up key	[▲]
Host cursor down key	[SFT]+[igvee]
Host cursor left key	$[SFT]+[\blacktriangleleft]$
Host cursor right key	[SFT]+[ightharpoondown]
Host cursor up key	$[SFT]+[\blacktriangle]$

Auxiliary Keypad

Auxiliary keys enter numeric data. The application software in use can also assign functions to these keys; refer to your VT/ANSI application software manual for their uses. Table 6-43 shows codes generated by the auxiliary keys in keypad Application mode.

Table 6-43 Auxiliary Keys and Codes Generated

VT/ANSI Key	Keypad Mode
0	SS3 p
1	SS3 q
2	SS3 r
3	$\mathrm{SS3}\mathrm{s}$
4	SS3 t
5	SS3 u
6	SS3 v
7	SS3 w
8	SS3 x
9	SS3 y
- (hyphen)	SS3 m
, (comma)	SS31
. (period)	SS3 n
Enter	SS3 M
PF1	SS3 P
PF2	SS3 Q
PF3	SS3 R
PF4	SS3 S

Top-Row Function Keys

Table 6-44 lists function keys and the codes generated.

Table 6-44 Top-Row Function Keys and Codes Generated

Key	VT220/320/VT340 Mode	VT100 Mode
F5 (Break)	No code	No code
F6	CSI 1 7 ~	No code
F7	CSI 1 8 ~	No code
F8	CSI 1 9 ~	No code
F9	CSI 2 0 ~	No code
F10	CSI 2 1 ~	No code
F11	CSI 2 3 ~	Esc
F12	CSI 2 4 ~	BS
F13	CSI 2 5 ~	LF
F14	CSI 2 6 ~	No code
F15	CSI 2 8 ~	No code
F16	CSI 2 9 ~	No code
F17	CSI 3 1 ~	No code
F18	CSI 3 2 ~	No code
F19	CSI 3 3 ~	No code
F20	CSI 3 4 ~	No code

Local Edit Mode

If your application software program supports local editing, the terminal can be programmed to operate in Local Edit mode. Local Edit mode is a feature of the VT330/VT340 terminal. Use the mode to send characters to page memory instead of to the host. The terminal sends a block of edited text to the host after you press a terminating key. Terminating keys in Local Edit mode are:

[ENTER]

[F1] through [F20]

Edit Mode and Interactive Mode

The edit mode control function (DECEDM) selects edit mode or interactive mode. The function determines when the terminal sends data to the host. Table 6-45 describes the modes.

Table 6-45 Local Edit Modes

Mode	Sequence*	Action
Set	CSI ? 1 0 h	Selects edit mode. (Turns on the annunciator in the display.) The terminal stores all typed characters in page memory for local editing. After the data is edited, it can be sent in a block to the host.
Reset	CSI ? 1 0 l	Selects interactive mode. (Turns off the annunciator in the display.) The terminal immediately sends typed characters to the host.

^{*} The last character in the reset sequence is lowercase L (6C hexadecimal).

Local Editing Setup

To use the terminal in Local Edit mode, the local editing features must be set up for the application software as described in Table 6-46.

Table 6-46 Local Editing Setup

Feature	Setting	Description
Edit mode	Edit	Edited text is stored in memory until you press a terminating key, which sends the text to the host.
Edit key execution mode		Not supported.
Transmit execution mode	Immediate	The terminal sends data to the host immediately after you press a terminating key.
Local editing application keys	Suffix transmit	When you press [F1] through [F20], the terminal sends that function to the host after sending a block of data.
Line transmit mode	Disabled	The terminal sends a full page of data to the host after you press a terminating key.
Transfer termination mode	Enabled	After you press a terminating key, the terminal sends the scrolling region, which is the area inside the scrolling margins.
VT131 transfer mode		Not supported.
Space compression	Disabled	The terminal sends a space character for each unused character position.
End of line characters		On the terminal, no characters indicate the end of a line in a data block.
End of block characters		On the terminal, no characters indicate the end of a data block.

Selecting Characters to Send

Three control functions allow you to define which characters the terminal can send to the host. Table 6-47 shows how the control functions select which characters the terminal sends.

Table 6-47 Selecting Character Fields for Transmission

Fields Selected		Selected Area Transfer Mode	-
All fields	Set	Set	Unavailable
Unprotected fields only	Reset	Set	Unavailable
Selected fields only	Set	Reset	Set
Selected field with cursor only	Set	Reset	Reset
Unprotected and selected fields	Reset	Reset	Set
Selected field with cursor only	Reset	Reset	Reset

Guarded Area Transfer Mode (GATM)

The guarded area transfer mode control function selects whether the terminal sends all characters or only unprotected characters to the host. When GATM is unprotected (reset), the terminal sends a record separator (RS, 1E hexadecimal) to the host in place of a protected field. Table 6-48 lists guarded area transfer modes.

Table 6-48

Guarded Area Transfer Modes

Mode	Sequence*	Action
Set (All)	CSI 1 h	Selects all characters. During block transmission, the terminal can send all protected and unprotected characters to the host.
Reset (Unprotected)	CSI 1 l	Selects unprotected characters. During a block transmission, the terminal can send only unprotected characters to the host.

^{*} The last character of the reset sequence is lowercase L (6C hexadecimal).

Selected Area Transfer Mode (SATM)

The selected area transfer mode control function determines whether the terminal can send all characters or only selected characters to the host. Selected characters are characters defined as eligible to send to the host. Table 6-49 lists selected area transfer modes.

Table 6-49
Selected Area Transfer Modes

Mode	Sequence*	Action
Set (All)	CSI 1 7 h	Selects all characters. The terminal can send selected and unselected characters on the current page to the host.
Reset (Unprotected)	CSI 1 7 l	Selects only selected characters. The terminal can only send selected characters on the current page to the host.

^{*} The last character of the reset sequence is lowercase L (6C hexadecimal).

Multiple Area Transfer Mode (MATM)

The multiple area transfer mode control function determines what selected character areas the terminal can send to the host. MATM work only when SATM is reset. Table 6-50 describes multiple area transfer modes.

Table 6-50 Multiple Area Transfer Modes

Mode	Sequence*	Action
Set (All)	CSI 1 5 h	The terminal can send all selected areas on the page to the host.
Reset (Unprotected)	CSI 1 5 l	Selects one area. The terminal can send only the selected area with the cursor. If the cursor is not in a selected field, cursor moves to the next selected field.

^{*} The last character of the reset sequence is lowercase L (6C hexadecimal).

Programming SECTION 6

Defining Selected Areas

Start selected area (SSA) and end selected area (ESA) control functions select which characters on the current page the terminal can send to the host. SSA and ESA are 8-bit C-1 control characters that can also be coded as 7-bit escape sequences.

The following conditions apply to SSA and ESA:

- ▶ They work only when SATM is reset.
- ▶ If the terminal receives ESA before SSA, it ignores ESA.
- ▶ If SSA is not followed by ESA on the same page, the SSA has no effect on that page. Selected areas must always end with ESA.
- ▶ Selected areas cannot be changed by the ED, EL, or ECH control functions.

Table 6-51 describes SSA and ESA.

Table 6-51
Start Selected Area and End Selected Area

Name (Mnemonic)	8-Bit	7-Bit Equivalent	Action
Start selected area (SSA)	SSA (86 hex)	ESC F (1B, 46 hex)	Marks the cursor position as the first of a string of character positions the terminal can send to the host.
End selected area (ESA)	ESA (87 hex)	ESC G (1B, 47 hex)	Defines the cursor position as the last of a string of character fields the terminal can send to the host.

Local Edit Mode Keys

Keys with special functions in Local Edit mode are described in Table 6-52.

Table 6-52 Local Edit Mode Keys

Key(s)	Function		
Find	Advances cursor to the top margin, Column 1.		
Tab	Advances cursor to the next tab stop. If in protected area, it advances to the next selectable field. If tab stop is selected, it advances to the next selectable field.		
Insert here	Default mode is "insert." The key toggles between insert and overstrike. If in insert mode, all following characters in the field are shifted right one position. If the field is full the last character is deleted.		
Remove	If in protected area, terminal beeps and the cursor advances to the first position of the next selectable field. If no selectable field is found, it advances to the bottom margin (the default is Row 24, Column 80). If in unprotected field, the field is cleared and the cursor is positioned to the beginning of the selectable field.		
Prev screen	Ignores this key.		
Next screen	Ignores this key.		
Select	Ignores this key.		
Backspace	Moves cursor one position to the left until it reaches the left margin.		
Delete	Deletes the previous selectable character.		
A-Z, 0-9, Auxiliary keypad	If one of these keys is pressed while in a protected area, the terminal beeps, advances the cursor to the next selectable field, and enters the characters. If no other selectable field is found, the cursor advances to the bottom margin.		
Back Tab	Cursor moves back to the first occurrence of the following:		
	▶ Previous tab stop.		
	▶ Beginning of the current unprotected field.		
	▶ Beginning of the previous unprotected field.		
	▶ Beginning of scrolling region. (Also called top margin.)		
Cursor [🛕]	Cursor moves up one line until it reaches the top margin. The terminal beeps when the cursor reaches the top margin.		
[▼]	Cursor moves down one line until it reaches the bottom margin. The terminal beeps when the cursor reaches the bottom margin.		
[▶]	Cursor moves right one character position until it reaches the right margin. The terminal beeps when the cursor reaches the right margin.		
[◀]	Cursor moves left one character position until it reaches the left margin. The terminal beeps when the cursor reaches the left margin.		

Programming SECTION 6

Scanning in Local Edit Mode

When scanning is enabled, data from the scanner is placed into the field where the cursor is located. If the cursor is not in an input field, the data from the scanner is placed into the next input field. If the data from the scanner fills the first input field, the remaining characters are placed into the next input field.

When the bar code does not fill the input field, the cursor stays where it ended. If autotab scanning is enabled, the cursor is placed at the beginning of the next input field. If not next input field is found, extra data will be lost.

Set Transmit Termination Character (DECTTC)

The terminal supports the set transmit termination character (DECTTC) control function. Use the control function to select a character to indicate the end of a block transmission. You do not need to use an end-of-block character. The terminal sends the end-of-block character to the host at the end of each block transmission.

The control sequence is:

CSI Ps |

Ps is the end-of-block character in the following chart.

End-of-Block Character	Action
No character (DECTTC disabled)	
FF (0C hexadecimal)	Form feed
ETX (03 hexadecimal)	End of text
EOT (04 hexadecimal)	End of transmission
CR (0D hexadecimal)	Carriage return
DC3 (13 hexadecimal)	XOFF
	No character (DECTTC disabled) FF (0C hexadecimal) ETX (03 hexadecimal) EOT (04 hexadecimal) CR (0D hexadecimal)

Use an extended form of DECTTC to select a string of characters to indicate the end of a block. The extended form uses decimal codes to represent characters. You can use the extended form to send a control function at the end of a block transmission, instead of a single character. You can send a control sequence of up to six characters (Pn1 through Pn6) at the end of a block.

The control sequence is:

Pn1 through Pn6 are decimal codes for characters you can define as end-of-block. For example, the decimal code for ESC is 27 (1B hexadecimal). A code outside the range of 0 to 254 is ignored. The tables on pages 6-3 and 6-6 contain decimal codes for characters.

> For example, to send the default code of the PF1 key on the terminal's numeric keypad at the end of a block transmission, use the following procedure.

1. The PF1 key sends this default code:

ESC O P

2. Translate each character in the sequence to decimal code.

ASCII characters: ESC O P Decimal codes: 27 79 80

3. Insert the decimal codes into the extended DECTTC sequence:

CSI ? 27 ; 79 ; 80 |

Programming **SECTION 6**

Section 7

Extended Commands

Overview

Extended commands govern abilities unique to terminals. You can use extended commands to transmit or receive data over the terminal's RS-232 port, send information to an RS-232 device (such as a printer or bar code printer), or collect data. The following chart lists the commands.

Name	Characters
Transmit and Receive On RS-232 Port	#F
Transmit Only On RS-232 Port	#P
Receive Only On RS-232 Port	#G
Set Parameters (supported only on 6400 and 5055 computers)	#H
Return Version	$\# { m V}$
Tone	$\#\mathrm{T}$
Scan	#S

To use extended commands, you must enable the extended command option through the TE configuration menus. See Section 4 for information about enabling the command on a 2415, 2425, 2455, or 248X terminal. For a 6400 or 5055 computer, refer to the computer's user manual.

Transmit and Receive On RS-232 Port (#F)

Use the Transmit and Receive On RS-232 Port extended command to transmit and receive data on the terminal's RS-232 port. The command uses "#F" characters to request communication on the port.

When constructing a Transmit and Receive command, the data to be sent should be placed at Line 2, Column 1. The data must be less than 1840 bytes in length (after "=yy" compression). The last character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character. For example:

Command	Action
CSI 25	Clears the screen.
CSI 1,3H P 3 N 8 1 0 0 0 05	Moves the cursor.
CSI 2,1H This is data to be sent #	Moves the cursor to Line 2, Column 1.
CSI 1,2H #	Moves the cursor to the beginning.

Extended Commands SECTION 7

Due to possible system fragmentation of a data stream, the "#" in Line 1, Column 2 should be the last character placed on the screen. This will assure that all data is present before the extended command is parsed (removed).

Control character sequences for mnemonics APC (application program command) and ST (string terminator) can also start and end data. The last data character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character and the string terminator sequence.

The output stream appears in ASCII character format. For bytes that are not displayable ASCII characters, you may insert the characters "=yy," where "yy" is the hexadecimal representation of the output byte.

Table 7-1 describes the line and columns where characters must appear, and their meanings.

Table 7-1

Transmit and Receive Characters

				_	
Line	1	്പ	liimne	2.	.2.4

Column	Description	Character
2	Extended command	#
3	Transmit and Receive On RS-232 Port command	F
4	Speed (bits per second)	1=1200 2=2400 3=4800 4=9600 5=19200 6=38400
5	Data parity	N=None 0 (zero)=None (Space)=None E=Even O=Odd
6	Data bits	7=Seven 8=Eight
7	Stop bits	1=One 2=Two
8	For 6400 and 5055 computers: CTS flow control For 2415, 2425, 2455, and 248X terminals: Reserved	0=Disable 1=Enable (Space)
9	For 6400 and 5055 computers: DTR flow control For 2415, 2425, 2455, and 248X terminals: Reserved	0=Disable 1=Enable (Space)
10	XON/XOFF flow control	0=Disable 1=Enable

SECTION 7 Extended Commands

Table 7-1 (Continued) Transmit and Receive Characters

Line 1, Columns 2-24

Column	Description	Character
11-12	Flow control timeout value	XX=Number of seconds
13-14	Maximum characters to receive	dd or XddX, where: dd=00-99. Default: 99. X=An uppercase literal. dd=Any number of decimal digits from 0-2000, inclusive. Default: 99.
15-16	Delimiter character	AA=Hexadecimal ASCII code that marks the end of data to be received. Range: 00–7E. Default of 00 implies no start character.
17-18	Number of delimiter characters	XX=Number of characters accepted before sending return code to host. Range: 00-99. Default of 00 implies no start character.
19-20	Start character	AA=Hexadecimal ASCII code. Range: 00-99. Default of 00 implies no start character.
21	Return start character to host	F=Return character (Space)=Do not return character
22	Flag parity errors	P=Flag (Space)=Do not flag
23-24	Receive timeout length	XX=Number of seconds the terminal waits for input from the RS-232 port before it sends a timeout error. Uses a default of 5 seconds when field is filled with spaces.

Flow Control

The Transmit command supports these types of flow control:

- ▶ RTS/CTS (6400 and 5055 computers)
- ► XON/XOFF

Use CTS and DSR flow control lines to show XON/XOFF conditions from the output device. Also use them to prevent output when the terminal has no output device. The DTR of the output device should connect to either the DSR or CTS lines.

XON/XOFF is the same XON/XOFF flow control most devices support. The timeout value tells the terminal how long to wait for the flow control handshake before returning a one-byte error value.

Extended Commands **SECTION 7**

Return Codes for Transmit and Receive **Command**

The Transmit and Receive return code is the status sent to the host computer. The terminal returns data and the extended command's status to the host computer in the following format:

\\X\CC\DATA<CR> or \\x\cccc\DATA<CR>

- ▶ "X" is the return code listed in the following chart.
- ▶ "CC" or "CCCC" is the character count of the data returned. "CC" is 00-99. "CCCC" is 100-2000.
- ▶ "DATA" is the RS-232 data received from the RS-232 device attached to the terminal (if any data was received). The terminal simulates the [Enter] key to return the code to the host.

Code	Description	Column
0	Good status, transaction complete.	(None)
1	Not enough memory. Or, incorrect setting for speed, number of data bits, number of stop bits, or flow control timeout.	4, 6, 7, 11-12
2	No delimiter (#) on data stream.	(None)
3	Timeout while using CTS flow control (6400 and 5055 computers only).	(None)
4	Timeout while using DTR flow control (6400 and 5055 computers only).	(None)
5	Timeout while using XON/XOFF flow control.	(None)
6	Improper return field.	(None)
7	Hexadecimal value is outside the range of 00-0F.	15-16, 19-20
8	Reserved.	(None)
9	Incorrect setting for maximum characters to receive.	13-14
A	Incorrect setting for delimiter character.	15-16
В	Incorrect setting for number of delimiter characters.	17-18
\mathbf{C}	Incorrect setting for CTS, DSR, or XON/OFF flow control.	8, 9, 10
D	Incorrect setting for start character.	19-20
\mathbf{E}	Incorrect setting for data parity.	5, 22
\mathbf{F}	Timeout.	(None)
O	Overrun of UART receive register; an error from the RS-232 device.	(None)
P	Data parity or framing error.	(None)

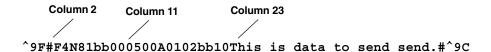
SECTION 7 Extended Commands

Examples of Transmit and Receive Command

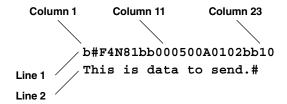
Extended command characters can be started by an APC sequence and ended by an ST sequence, or started by a space and ended by a "#" character.

When control character sequences for APC and ST start and end data, all the data is on Line 1. A "#" character is before the sequence for ST at the end of the line. Control character sequences are not displayed, which results in a faster transmission rate. Also, the cursor position is not lost.

The following example shows data started and ended by control character sequences. Sequences are prefixed by the notation " ^ " which represents "control."



The following example shows a space as the start of the data and a "#" character as the end. The data is on two lines. A "b" indicates a space.



Following is an example of data transmitted and received on the RS-232 port for 6400 and 5055 computers. A space and "#" character start and end the data.

Column	Character	Description
1	(Space)	This column typically contains a space.
2	#	Extended command.
3	\mathbf{F}	Transmit and Receive command.
4	4	9600 baud.
5	N	No parity.
6	8	Eight data bits.
7	1	One stop bit.
8	0	No CTS flow control.
9	0	No DTR flow control.
10	0	No XON/OFF flow control.
11-12	00	No flow control timeout value.
13-14	50	Receive a maximum of 50 characters.
15-16	0A	Delimiter character is 0A hexadecimal (line feed).
17-18	01	Data will be sent to host after one delimiter character has been received.
19-20	02	Start character is 02 hexadecimal (STX).
21	(Space)	Start character will not be returned.
22	(Space)	Do not flag parity errors.
23-24	10	Receive timeout length is 10 seconds.

Extended Commands SECTION 7

Transmit Only On RS-232 Port (#P)

The Transmit Only On RS-232 Port extended command lets the terminal send information to a slaved RS-232 device, such as a receipt printer or bar code printer. The command uses the RS-232 communications port to send data to the device. The terminal checks data from the host computer for a transmit sequence, then sends the requested data. The host computer signals the terminal for a transmit command by inserting the characters "#P" into the display at Line 1, Columns 2 and 3. Characteristics of the transmission immediately follow the #P command.

When constructing a Transmit Only command, the data to be sent should be placed at Line 2, Column 1. The data must be less than 1840 bytes in length (after "=yy" compression). The last character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character. For example:

Command	Action
CSI 25	Clears the screen.
CSI 1,3H P 3 N 8 1 0 0 0 05	Moves the cursor.
CSI 2,1H This is data to be sent #	Moves the cursor to Line 2, Column 1.
CSI 1,2H #	Moves the cursor to the beginning.

Due to possible system fragmentation of a data stream, the "#" in Line 1, Column 2 should be the last character placed on the screen. This will assure that all data is present before the extended command is parsed (removed).

Control character sequences for mnemonics APC (application program command) and ST (string terminator) can also start and end data. The last data character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character and the string terminator sequence.

The output stream takes the form of ASCII characters. For nondisplayable ASCII characters, you may insert the characters "=yy," where "yy" is the hexadecimal representation of the output byte.

Table 7-2 describes the line and columns where characters must appear, and their meanings.

SECTION 7 Extended Commands

 $Table\ 7-2$ Transmit Only Characters

Line 1, Columns 2-12

Column	Description	Character
2	Extended command	#
3	Transmit Only On RS-232 Port command	P
4	Speed (bits per second)	1=1200 2=2400 3=4800 4=9600 5=19200 6=38400
5	Data parity	N=None 0 (zero)=None (Space)=None O=Even E=Odd
6	Data bits	7=Seven 8=Eight
7	Stop bits	1=One 2=Two
8	For 6400 and 5055 computers: CTS flow control For 2415, 2425, 2455, and 248X terminals: Reserved	0=Disable 1=Enable (Space)
8	For 6400 and 5055 computers: DTR flow control For 2415, 2425, 2455, and 248X terminals: Reserved	0=Disable 1=Enable (Space)
10	XON/XOFF flow control	0=Disable 1=Enable
11-12	Flow control timeout value	XX=Number of seconds

Flow Control

Transmit Only supports RTS/CTS, DTR/DSR, and XON/XOFF. For descriptions, see page 7-3.

Extended Commands SECTION 7

Return Codes for Transmit Only Command

The Transmit Only return code is the status sent to the host computer. The terminal returns the extended command's status to the host computer in the following format:

\\X<CR>

where "X" is the return code listed in the following chart. The terminal simulates the [Enter] key to return the code to the host.

Code	Description	Column
0	Good status, transaction complete.	(None)
1	Not enough memory. Or, incorrect setting for speed, number of data bits, number of stop bits, or flow control timeout.	4, 6, 7, 11-12
2	No delimiter (#) on data stream.	(None)
3	Timeout while using CTS flow control (6400 and 5055 computers only).	(None)
4	Timeout while using DTR flow control (6400 and 5055 computers only).	(None)
5	Timeout while using XON/XOFF flow control.	(None)
6	Improper return field.	(None)
С	Incorrect setting for CTS, DTR, or XON/OFF flow control.	8, 9, 10
${f E}$	Incorrect setting for data parity.	5
O	Overrun of UART receive register.	(None)
P	Data parity or framing error.	(None)

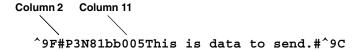
Examples of Transmit Only Command

Extended command characters can be started by an APC sequence and ended by an ST sequence, or started by a space and ended by a "#" character.

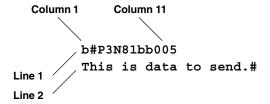
When control character sequences for APC and ST mark data, all of the data is on Line 1. A "#" character is before the sequence for ST at the end of the line. Control character sequences are not displayed, which results in a faster transmission rate. The cursor position is not lost.

SECTION 7 Extended Commands

> The following example shows data started and ended by control character sequences. Sequences are prefixed by the notation " ^ " which represents "control."



The following example shows a space as the start of the data and a "#" character as the end. The data is on two lines. A "b" indicates a space.



Following is an example of data transmitted and received on the RS-232 port for 6400 and 5055 computers. A space and "#" character start and end the data.

Column	Character	Description	
1	(Space)	This column typically contains a space.	
2	#	Extended command.	
3	P	Transmit Only command.	
4	3	4800 baud.	
5	N	No data parity.	
6	8	Eight data bits.	
7	1	One stop bit.	
8	0	No CTS flow control.	
9	0	No DTR flow control.	
10	0	No XON/XOFF flow control.	
11-12	05	Flow control timeout is 5 seconds.	

Extended Commands SECTION 7

Receive Only On RS-232 Port (#G)

The Receive Only On RS-232 Port extended command provides a way to use the RS-232 port on the terminal to collect data. A scale is one example of a use for this command. The host computer sends "#G" characters to alert the terminal for activity on the port.

When constructing a Receive Only command, the data to be sent should be placed at Line 2, Column 1. The data must be less than 1840 bytes in length (after "=yy" compression). The last character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character. For example:

Command	Action
CSI 25	Clears the screen.
CSI 1,3H P 3 N 8 1 0 0 0 05	Moves the cursor.
CSI 2,1H This is data to be sent #	Moves the cursor to Line 2, Column 1.
CSI 1,2H #	Moves the cursor to the beginning.

Table 7-3 describes the line and columns where characters must appear, and their meanings.

Table 7-3
Receive Only Characters

т•	-	a 1		0 04
Lane	١.	CO	lumns	Z-Z4

Column	Description	Character
2	Extended command	#
3	Receive Only On RS-232 Port command	G
4	Speed (bits per second)	1=1200 2=2400 3=4800 4=9600 5=19200 6=38400
5	Data parity	N=None 0 (zero)=None (Space)=None O=Odd E=Even
6	Data bits	7=Seven 8=Eight
7	Stop bits	1=One 2=Two

Table 7-3 (Continued) Receive Only Characters

Line 1, Columns 2-24

Column	Description	Character
8	Reserved	(Space)
9	Reserved	(Space)
10	Reserved	(Space)
11-12	Reserved	(Spaces)
13-14	Maximum characters to receive	dd or XddX, where: dd=00-99. Default: 99. X=An uppercase literal. dd=Any number of decimal digits from 0-2000, inclusive. Default: 99.
15-16	Delimiter character	AA=Hexadecimal ASCII code which marks the end of valid data to be received. Range: 00-7E. Default: 00.
17-18	Number of delimiter characters	XX=Delimiter characters received before transmitting return code to host. Range: 00-99. Default: 00.
19-20	Start character	AA=Hexadecimal ASCII code for start character. Range: 00-99. Default of 00 implies no start character.
21	Return start character to host	F=Return character (Space)=Do not return character
22	Flag parity errors	P=Flag (Space)=Do not flag
23-24	Receive timeout length	XX=Number of seconds the terminal waits for input from the RS-232 port before it sends a timeout error. Uses a default of 5 seconds when this field is filled with spaces.

Extended Commands **SECTION 7**

Return Codes for Receive Only Command

The Receive Only return code is the status sent to the host computer. The terminal returns data and the extended command's status to the host computer in the following format:

\\X\CC\DATA<CR> or \\X\CCCC\DATA<CR>

"DATA" is the RS-232 data received from the RS-232 device attached to the terminal (if any data was received). The terminal simulates the [Enter] key to return the code to the host.

Code	Description	Column
0	Good status, transaction complete.	(None)
1	Not enough memory. Or, incorrect setting for speed, number of data bits, or number of stop bits.	4, 6, 7
2	No delimiter (#) on data stream.	(None)
6	Improper return field.	(None)
7	Hexadecimal value is outside the range of 00-0F.	15-16, 19-20
8	Reserved.	(None)
9	Incorrect setting for maximum characters to receive.	13-14
A	Incorrect setting for delimiter character.	15-16
В	Incorrect setting for number of delimiter characters.	17-18
D	Incorrect setting for start character.	19-20
${f E}$	Incorrect setting for data parity.	5, 22
\mathbf{F}	Timeout.	(None)
O	Overrun of UART receive register.	(None)
P	Data parity or framing error.	(None)

[&]quot;X" is the return code listed in the following chart.

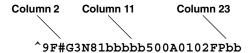
[&]quot;CC" or "CCCC" is the character count of the received data. "CC" is 00-99. "CCCC" is 100-2000.

Examples of Receive Only Command

Receive Only extended command characters can be started by an APC sequence or by a space.

When the control character sequence for APC starts data, all of the data is on Line 1. The control character sequence is not displayed, which results in a faster transmission rate. Also, the cursor position is not lost.

The following example shows data marked by the control character sequence for APC. The sequence is prefixed by the notation " ^ " which represents "control."



The following example shows a space as the start of the data. A "b" indicates a space.



Following is an example of data received on the terminal's RS-232 port. A space starts the data.

Column	Character	Description
1	(Space)	This column typically contains a space.
2	#	Extended command.
3	\mathbf{G}	Receive Only command.
4	3	4800 baud.
5	N	No data parity.
6	8	Eight data bits.
7	1	One stop bit.
8	(Space)	Reserved.
9	(Space)	Reserved.
10	(Space)	Reserved.
11-12	(Spaces)	Reserved.
13-14	50	Receive a maximum of 50 characters.
15-16	0A	Delimiter character is 0A hex (line feed).
17-18	01	Data will be sent to host after one delimiter character has been received.
19-20	02	Start character is 02 hexadecimal (STX).
21	\mathbf{F}	Start character will be returned to host.
22	P	Parity errors will be flagged
23-24	10	Receive timeout length is 5 seconds.

Extended Commands SECTION 7

Set Parameters (#H)

NOTE:

Only the 6400 and 5055 computers support the #H extended command.

Use Set Parameters to set TE configuration parameters that you would otherwise set at the terminal. The parameters are part of the configuration menus.

Set most of the parameters once per terminal. You can set them when you install a network or when you add terminals to the network. Unless the terminal fails (perhaps a dead battery) or a user does something destructive (such as a RAM test), you probably will not need to set them again.

When constructing a Set Parameters command, the data to be sent should be placed at Line 2, Column 1. The data must be less than 1840 bytes in length (after "=yy" compression). The last character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character. For example:

Command	Action
CSI 25	Clears the screen.
CSI 1,3H P 3 N 8 1 0 0 0 05	Moves the cursor.
CSI 2,1H This is data to be sent #	Moves the cursor to Line 2, Column 1.
CSI 1,2H #	Moves the cursor to the beginning.

Table 7-4 lists columns in which characters must appear.

NOTE:

Some parameters do not apply to all terminal models. Refer to the terminal's user manual for applicable parameters.

Table 7-4
Set Parameters Characters

Line 1, Columns 2-36

Column	Description	Character
2	Extended command	#
3	Set Parameters command	Н
4-6	Backlight timer	(Spaces)=No change from current setting 000=On continuously 001-255=Seconds to remain on
7-9	Reserved	(Spaces)
10	Cursor mode	(Space)=No change from current setting 1=Underline (default) 2=Underline blink 3=Block 4=Block blink

Table 7-4 (Continued) Set Parameters Characters

Line 1, Columns 2-36

Column	Description	Character
11	Screen mode (a screen mode value	(Space)=No change from current
	must be sent, but it is ignored)	setting
		1=Center cursor
		2=Corner
10	D 1	3=Page
12	Reserved	(Space)
13-15	Beeper volume	(Space)=No change from current
		setting
16-18	Baaran fransısını	000-255=Range in seconds
10-18	Beeper frequency	(Spaces)=No change from current setting
		000-030=Range (larger is higher)
19-21	Beeper length	(Spaces)=No change from current
19-21	Deeper length	setting
		000-010=Duration in seconds
22	Delete key mapping	(Spaces)=No change from current
	zerete nej mapping	setting
		0=Delete key is delete (7F hex)
		1=Delete key is backspace (08 hex)
23	Carriage return expansion mapping	(Spaces)=No change from current
		setting
		0=CR
		1=CR/LF
24	Local host echo	(Spaces)=No change from current
		setting
		0=Host echo
<u> </u>	D :	1=Local echo
25-27	Primary screen size (rows)	(Spaces)=No change from current
		setting
		000-255=Number of rows per display screen
28-30	Drimany garoon gigo (columns)	
∠o−ou	Primary screen size (columns)	(Spaces)=No change from current setting
		000–255=Number of columns per
		display screen
31-33	Reserved	(Spaces)
34-36	Reserved	(Spaces)
04-00	THOSE YOU	(Dpaces)

Extended Commands **SECTION 7**

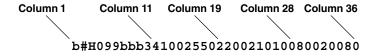
Return Codes for Set Parameters Command

Line 24, Column 1 has the return status field. The code returned in this position tells the host the status of the extended command. The Set Parameters return code is the status sent to the host computer. The following chart lists return

Code	Description	Column	
0	Good status, transaction complete.	(None)	
1	Backlight timer parameter invalid.	4-6	
2	Sleep mode timer parameter invalid.	7-9	
3	Normal cursor set parameter invalid.	10	
4	Insert cursor set parameter invalid.	11	
5	Remote display parameter invalid.	12	
6	Shift key unlock parameter invalid.	13	
7	Keyboard lock parameter invalid.	14	
8	Beeper volume parameter invalid.	15-17	
9	Beeper frequency parameter invalid.	18-20	
A	Beeper length parameter invalid.	21-23	
В	Stream scan parameter invalid.	24	
\mathbf{E}	Incorrect setting for number of rows.	25-27	
\mathbf{F}	Incorrect setting for number of columns.	28-30	

Example of Set Parameters Command

The following example shows data for Set Parameters. A "b" indicates a space.



Column	Character	Description
1	(Space)	This column typically contains a space.
2	#	Extended command.
3	H	Set Parameters command.
4-6	099	Backlight stays on for 99 seconds.
7-9	(Spaces)	Reserved.
10	3	Cursor is in block mode.
11	(Space)	No change from current setting.
12	(Space)	Reserved.
13	0	Shift key unlock is disabled.
14	0	Keyboard lock is disabled.
15-17	255	Beeper volume is set at 255.
18-20	022	Beeper frequency setting is set at 22.
21-23	002	Beeper length is 2 seconds.
24	1	Stream scan setting is enabled.
25-27	010	Number of rows in primary screen size is 10.
28-30	080	Number of columns in primary screen size is 80.
31-33	(Spaces)	Reserved.
34-36	(Spaces)	Reserved.

Return Version (#V)

The Return Version extended command returns the current terminal emulation name and version to the host computer. Table 7-5 lists columns in which characters must appear.

Table 7-5 Return Version Characters

Line 1, Columns 2-3

Column	Description	Character
2	Extended command	#
3	Return Version command	V

The return code is the status sent to the host computer. The code indicates if the extended command was successful. The terminal returns data and the extended command's status to the host computer in the following format:

\\0\<Program name> <Version> <CR>

where:

- ▶ "0" is the return code, which indicates "good status, transaction complete."
- ▶ "<Program name>" is the TE program name.
- ▶ "<Version>" is the program version.

Following is an example:

\\0\FWP242H0 V6.09 <CR>

The following example shows data started by the control character sequence for APC. The sequence is prefixed by the notation " ^ " which represents "control."

Column 2 ^9F#V^9C

Extended Commands SECTION 7

Tone (#T)

The Tone extended command causes the terminal to make a tone of a specified volume, frequency, and length.

When constructing a Tone command, the data to be sent should be placed at Line 2, Column 1. The data must be less than 1840 bytes in length (after "=yy" compression). The last character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character. For example:

Command	Action
CSI 25	Clears the screen.
CSI 1,3H P 3 N 8 1 0 0 0 05	Moves the cursor.
CSI 2,1H This is data to be sent #	Moves the cursor to Line 2, Column 1.
CSI 1,2H #	Moves the cursor to the beginning.

Table 7-6 describes the line and columns where characters must appear, and their meanings.

Table 7-6 **Tone Options**

Line 1, Columns 2-12			
Column	Description	Character	
2	Extended command	#	
3	Tone command	T	
4-6	Volume	(Spaces)=No change from current setting	
		000-255=Range. The larger the number, the louder the volume.	
7-9	Frequency	(Spaces)=No change from current setting	
		000-030=Range. The larger the number, the higher the frequency.	
10-12	Length	(Spaces)=No change from current setting	
		001-010=Duration in seconds. The larger the number, the longer the beep and the slower the keyboard response time.	

The return code is the status sent to the host computer; the code indicates if the extended command was successful. The terminal returns data and the extended command's status to the host computer in the following format:

\\X<CR>

"X" is the return code listed in the following chart.

Code	Description	Column
0	Good status, transaction complete.	(None)
8	Incorrect setting for volume.	4-6
9	Incorrect setting for frequency.	7-9
A	Incorrect setting for length.	10-12

Scan (#S)

The Scan extended command allows host systems to have the same capabilities as terminals using the Native data stream to set bar code parameters and scan.

By inserting characters "#S" in the display buffer at Line 1, Columns 2 and 3, the host computer tells the terminal to expect a Scan extended command. Appropriate descriptive characteristics should follow the "#S" characters. The terminal returns a code that indicates if the command was successful. Then it simulates the [Enter] key to return a value to the host computer.

When constructing a Scan command, the data to be sent should be placed at Line 2, Column 1. The data must be less than 1840 bytes in length (after "=yy" compression). The last character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character. For example:

Command	Action
CSI 25	Clears the screen.
CSI 1,3H P 3 N 8 1 0 0 0 05	Moves the cursor.
CSI 2,1H This is data to be sent #	Moves the cursor to Line 2, Column 1.
CSI 1,2H #	Moves the cursor to the beginning.

Due to possible system fragmentation of a data stream, the "#" in Line 1, Column 2 should be the last character placed on the screen. This will ensure that all data is present before the extended command is parsed (removed).

Table 7-7 lists the command. Tables on the following pages list options.

Line 1 Columns 9-9

Table 7-7 Scan Characters

Line 1, Columns 2-3			
Column	Description	Character	
2	Extended command	#	
3	Scan command	S	

Extended Commands **SECTION 7**

CC Byte 1

Control Character Byte 1 (CC Byte 1) implementation differs among the types of terminals.

2415, 2425, 2455, or 248X Terminal

Table 7-8 shows the CC Byte 1 options for scanning.

Table 7-8 CC Byte 1

Line 1, Column 4

CC Byte 1	Laser	Disable Scanner	No Change From Current Setting
0	•		
1	•		
2			
3	•		
4			
5	•		
6			
7	•		
8			
9	•		
A			
В	•		
\mathbf{C}			
D	•		
${f E}$			
\mathbf{F}		•	
(Space)			•

6400 or 5055 ComputerTable 7-9 shows the CC Byte 1 options for scanning.

NOTE: The 6400 computer does not support HP Wand Select.

Table 7-9 CC Byte 1

Line 1, Column 4

CC Byte 1	HP Wand Select	Redundancy	Laser	No Redundancy
0			•	•
1		•	•	
2		•		
3		•	•	
4	•			•
5	•	•	•	
6	•	•		
7	•	•	•	
8				•
9		•	•	
A		•		
В		•	•	
\mathbf{C}	•			•
D	•	•	•	
\mathbf{E}	•	•		
\mathbf{F}		Disable scar		
(Space)	N	o change from cur	rent settii	ng.

CC Byte 2

CC Byte 2 implementation differs among the types of terminals.

2415, 2425, 2455, or 248X Terminal

Table 7-10 shows CC Byte 2 options.

Table 7-10 CC Byte 2

Line 1, Column 5

CC Byte 2	Scan Termination Character
0–3	None
4–7	Auto Enter Scan
8–F	Auto Tab Scan
(Space)	No change from current setting

6400 or 5055 Computer

Table 7-10 shows the CC Byte 2 options the characters support.

 $Table\ 7-11$ CC Byte 2

Line 1, Column 5

CC Byte 2	Scan Termination Character	Modulo 10 Check Digit
0	None	
1		•
2		
3		•
4	[Enter] key	
5		•
6		
7		•
8	[Tab] key	
9		•
A		
В		•
${f C}$		
D		•
${f E}$		
F		•

CC Byte 3

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

Table 7-12 shows CC Byte 3 options for 6400 and 5055 computers.

Table 7-12 CC Byte 3

Line 1, Column 6

CC Byte 3	Enable Stream Scanning	Reserved	Return Bar Code Type	Bar Code Concatenated
0				
1				•
2			•	
3			•	•
4		•		
5		•		•
6		•	•	
7		•	•	•
8	•			
9	•			•
A	•		•	
В	•		•	•
\mathbf{C}	•	•		
D	•	•		•
${f E}$	•	•	•	
${f F}$	•	•	•	•
(Space)		No change	from current se	etting

Bar Code Length

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

Bar Code Length sets the minimum and maximum character lengths for all types of bar codes scanned (Table 7-13). Setting the minimum and maximum values to their optimum can increase scanning performance. If the terminal scans bar codes that are outside the minimum and maximum value, the terminal ignores the bar code.

Extended Commands **SECTION 7**

Table 7-13 Bar Code Length

Line 1, Columns 7-10

Column	Character and Description
7-8	XX=Bar code length. Maximum length: 99. (Spaces)=No change from current setting
9-10	XX=Bar code length. Minimum length: 00. (Spaces)=No change from current setting

UPC

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals. The 6400 computer does not support UPC-E Number System 1.

Use the UPC command to select the combinations of characters listed in Table 7-14.

Table 7-14 **UPC Bar Code Characters**

Character	UPC-E # System 1	Expand UPC-E to UPC-A	UPC-E # System 0	Add-ons	UPC-A
0			Disables all.	l	
1				•	•
2			•		•
3			•	•	•
4		•			•
5		•		•	•
6		•	•		•
7		•	•	•	•
8	•				•
9	•			•	•
10	•		•		•
11	•		•	•	•
12	•	•			•
13	•	•		•	•
14	•	•	•		•
15	•	•	•	•	•
(Space)		No cha	ange from current setti	ng	•

EAN Algorithms

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

Use EAN Algorithms to select combinations of EAN options (Table 7-15).

Table 7-15 **EAN Algorithms**

Line 1, Column 12

Character	Description
0	EAN disabled
1	EAN with Add-ons enabled
2	EAN enabled
3	EAN and EAN with Add-ons enabled
(Space)	No change from current setting

Code 39

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

Code 39 (Table 7-16) sets the scanner to read simple Code 39 bar codes that do not include extended or encoded sequences.

Table 7-16 Code 39 Algorithms Characters

Line 1, Column 13

Character	Description
0	Code 39 disabled
1	Encoded Code 39 enabled
2	Extended Code 39 enabled
3	Code 39 enabled
(Space)	No change from current setting

Extended Code 39 is a superset of Code 39 and scans all regular Code 39 bar codes. You cannot select both Code 39 and Extended Code 39. Encoded Code 39 combines key presses with normal bar code data.

Appendix A contains Encoded Code 39 sequences.

Extended Commands **SECTION 7**

Plessey

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals. The 6400 computer does not support Plessey alpha characters.

If the Plessey bar code scanning algorithm is enabled, set its check digits (Table 7-17) according to your requirements. Refer to the manufacturer's bar code specifications for more information on check digits.

Table 7-17 Plessey Characters

Line 1, Column 14

Character	Description
0	Plessey disabled
1	Plessey enabled
(Space)	No change from current setting

The dots in Table 7-18 indicate the Plessey check digits the characters support.

Table 7-18 Plessey Check Digit Characters

Line 1, Column 15

Character	Keep 2nd Digit Check	Do Not Validate 1st Check Digit	Keep 1st Check Digit	Mod 10 1st Check Digit	Mod 11 1st Check Digit
0					•
1				•	
2			•		•
3			•	•	
4		•			•
5		•		•	
6		•	•		•
7		•	•	•	
8			•		•
9			•	•	
A	•		•		•
В	•		•	•	
\mathbf{C}		•	•		•
D		•	•	•	
${f E}$	•	•	•		•
\mathbf{F}	•	•	•	•	
(Space)		ľ	No change from cu	ırrent setting	

Codabar

► NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

The Codabar options (Codabar and ABC Codabar) are mutually exclusive coding algorithms and cannot be selected at the same time.

Table 7-19 Codabar Characters

Line 1, Column 16

Character	Description
0	Codabar disabled
1	Codabar enabled
2	ABC Codabar enabled
(Space)	No change from current setting

Code 11

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals. Not supported on 6400 and 5055 computers.

Table 7-20 lists Code 11 characters.

Table 7-20 Code 11 Characters

Line 1, Column 17

Character	Description
0	Code 11 disabled
1	Code 11 enabled
(Space)	No change from current setting

Code 93

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

Code 93 and Code 128 options can be enabled.

Table 7-21 Code 93 Characters

Line 1, Column 18

Character	Description
0	Code 93 disabled
1	Code 93 enabled
(Space)	No change from current setting

Extended Commands SECTION 7

Code 128

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

Table 7-22 lists Code 128 characters.

Table 7-22 Code 128 Characters

Line 1, Column 19

Character	Description
0	Code 128 disabled
1	Code 128 enabled
(Space)	No change from current setting

Straight or Computer Identics 2of5

► NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

If the Straight or Computer Identics bar code is enabled, select the maximum and minimum lengths and the 1st and 2nd fixed bar code lengths according to your requirements (Table 7-23).

Table 7-23 2 of 5 Characters

Line 1, Columns 20-28

Column	Character		
20	0=Straight and Computer Identics 2 of 5 disabled		
	1=Computer Identics 2 of 5 enabled		
	2=Straight 2 of 5 enabled		
	(Space)=No change from current setting		
23-24	XX=minimum length Straight or Computer Identics 2 of 5. Refer to the		
	manufacturer's bar code specifications for more information.		
	(Spaces)=No change from current setting		
25-26	XX=1st fixed bar code length for Straight or Computer Identics 2 of 5.		
	Refer to the manufacturer's bar code specifications for more information.		
	(Spaces)=No change from current setting		
27-28	XX=2nd fixed bar code length for Straight or Computer Identics 2 of 5.		
	Refer to the manufacturer's bar code specifications for more information.		
	(Spaces)=No change from current setting		

Interleaved 2 of 5

NOTE:

Not available for 2415, 2425, 2455, and 248X terminals.

If Interleaved 2 of 5 is enabled, select the maximum and minimum lengths and the 1st and 2nd fixed bar code lengths according to your requirements (Table 7-24).

Table 7-24 Interleaved 2 of 5 Characters

Line 1, Columns 29-37

Column	Character
29	0=Interleaved 2 of 5 disabled
	1=Interleaved 2 of 5 enabled
	(Space)=No change from current setting
30-31	XX=maximum length Interleaved 2 of 5. Refer to the manufacturer's bar
	code specifications for more information.
	(Spaces)=No change from current setting
32-33	XX=minimum length Interleaved 2 of 5. Refer to the manufacturer's bar
	code specifications for more information.
	(Spaces)=No change from current setting
34-35	XX=1st fixed length for Interleaved 2 of 5 Bar Code. Refer to the
	manufacturer's bar code specifications for more information.
	(Spaces)=No change from current setting
36-37	XX=2nd fixed length for Interleaved 2 of 5 Bar Code. Refer to the
	manufacturer's bar code specifications for more information.

Return Codes for Scan Command

The Scan command's return code is the status sent to the host computer; the code indicates if the extended command was successful. The terminal returns data and the extended command's status to the host computer in the following format:

\\X<CR>

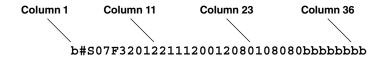
where "X" is the return code listed in the following chart. The terminal simulates the [ENTER] key to return a value to the host computer. If a hexadecimal number is entered wrong, the return code defaults to "0."

Code	Description
0	Good status, transaction complete
1	Bad status, transaction incomplete

Extended Commands **SECTION 7**

Example of Scan Command

The following example and chart show data for the Scan command. A "b" indicates a space.



Column	Character	Description
1	(Space)	This column typically contains a space.
2	#	Extended command.
3	S	Scan command.
4	0	No Control Byte 1 options are returned.
5	7	[ENTER] key terminates all scans, 12-volt laser is enabled, Modulo 10 Check Digit.
6	\mathbf{F}	Barcode type is returned and concatenated.
7-8	32	Maximum length is 32 characters.
9-10	01	Minimum length is 1 character.
11	2	Decode UPC System 0.
12	2	EAN is enabled.
13	1	Encoded code 39 is enabled.
14	1	Plessey is enabled.
15	1	Mod 10 first digit is checked.
16	2	ABC Codabar is enabled.
17	0	Code 11 is disabled.
18	0	Code 93 is disabled.
19	1	Code 128 is enabled.
20	2	Straight 2 of 5 is enabled.
21-22	08	Straight 2 of 5 maximum length is 8.
23-24	01	Straight 2 of 5 minimum length is 1.
25-26	08	Straight 2 of 5 1st fixed length is 8.
27 - 28	08	Straight 2 of 5 2nd fixed length is 8.
29	0	Interleaved 2 of 5 is disabled.
30-31	(Spaces)	No change from current setting.
32-33	(Spaces)	No change from current setting.
34 - 35	(Spaces)	No change from current setting.
36 - 37	(Spaces)	No change from current setting.

Appendix A

Bar Code Scanning

This appendix lists bar code labels for VT/ANSI TE commands and functions. It also contains Encoded Code 39 key press sequences.

NOTE:

To scan the bar code labels, you must configure the terminal to use Code 39 in Full ASCII

- ▶ For the 2415, 2425, 2455, or 248X terminal, configure the mode through the TRAKKER Antares® 2400 Menu System. For help, refer to the terminal's user manual.
- ▶ For the 6400 or 5055 computer, configure the mode through the terminal emulation configuration menus. For help, refer to the computer's user manual.

Cursor Keys

Window/Viewport up (up one line)

Window/Viewport down (down one line)

Window/Viewport right (right one character)

Window/Viewport left (left one character)





%RT



%LF

Paging Keys

Page up

%PGUP

%PGRT

%PGLT

Page down

Page right

Page left

Bar Code Scanning APPENDIX A

Tab Keys

Back Tab

Forward Tab





Special Function Keys

Backspace

Delete (Del)





Editing Keys

Find (VT220/320 only)

Insert (VT220/320 only)

Next Screen (VT220/320 only)

Previous Screen (VT220/320 only)

Remove (VT220/320 only)

Select (VT220/320 only)



%FIND



%INS





%PREV



%REM



%SEL

APPENDIX A Bar Code Scanning

Top-Row Function Keys

► NOTE:

VT220/320 terminals only support function keys F1 (PF1) through F20. VT100 terminals only support function keys F11, F12, and F13.

F1	
F2	
F3	*%F3*
F4	
F5	/%F5*
F6	/%I 3
F7	*%F7*
F8	*%F8*
F9	/%F9*
F10	*%F10*
F11	/% 10
F12	*%F12*
F13	*%F13*
F14	
F15	*%F14*

Bar Code Scanning APPENDIX A

F16	∭ ∭
F17	∭ ∭
F18	∭ ∭
F19	∭ ∭
F20	

Transmission Mode

Scan the following bar code label to toggle between Line Edit (block) mode and Character mode:

F21



%F21

VT/ANSI Additional Functions

TE configuration menus



*%TECFG

Bar codes are not supported for these functions:

- ▶ Toggling between Application mode and Numeric Keypad mode
- ▶ Transmitting the AnswerBack field to the host

To enter these functions, see the key sequence in Section 3, "Using the Terminal's Keyboard."

Auto-Login Restart

Auto-Login Restart



%ALRS

APPENDIX A Bar Code Scanning

Encoded Code 39

Table A-1 lists escape characters and key press sequences for Encoded Code 39. The "(t)" in the table indicates a terminating key. Any bar code data following this key code is ignored. The "t" sequences, therefore, should be located only at the end of the bar code. If you attempt to use an invalid sequence (termed "reserved" in the table) the terminal will beep and the data stream will be flushed.

Bar Code Scanning APPENDIX A

 $Table\ A ext{-}1$ Key Press Sequences for Encoded Code 39

Sequence	Key
\$space	Find (t)
\$ -	Insert here (t)
\$.	Remove (t)
\$0	Keypad 0 (t)
\$1	Keypad 1 (t)
\$2	Keypad 2 (t)
\$3	Keypad 3 (t)
\$4	Keypad 4 (t)
\$5	Keypad 5 (t)
\$6	Keypad 6 (t)
\$7	Keypad 7 (t)
\$8	Keypad 8 (t)
\$9	Keypad 9 (t)
\$A	New line (t)
B	Delete (t)
\$C	Forward Tab (t)
\$D	Forward Tab (t)
\$E	Reserved
\$F	Reserved
\$G	Reserved
\$H	Backspace (t)
\$I	Reserved
J	Reserved
\$K	Reserved
L	Reserved
M	Enter (t)
\$N	Reserved
\$O	Reserved
\$P	Reserved
Q	PF1 (t)
\$R	PF2 (t)
\$S	PF3 (t)
\$T	PF4 (t)
\$U	F5 (t)
V	F6 (t)
\$W	F7 (t)
\$X	F8 (t)
\$Y	F9 (t)
Z	F10 (t)

APPENDIX A Bar Code Scanning

Table A-1 (Continued)
Key Press Sequences for Encoded Code 39

%-space Select (t) %- Previous screen (t) %. Next screen (t) %0 Enter (t) %1 00 hexadecimal (t) %2 01 hexadecimal (t) %3 02 hexadecimal (t) %4 03 hexadecimal (t) %5 04 hexadecimal (t) %6 05 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %4 Reserved %B F11 (t) %C F12 (t) %D Reserved %F ; (semicolon) %G < (less than) %H = (equal) %I > (greater than) %J ? (question mark) %K [(left brace) %L \ (backslash) %M] (right brace) %N ^ (circumflex) %O _ (underscore) %P { (left brace) %E ~ (tilde) %T Keyboard delet	Sequence	Key
%. Next screen (t) %0 Enter (t) %1 00 hexadecimal (t) %2 01 hexadecimal (t) %3 02 hexadecimal (t) %4 03 hexadecimal (t) %5 04 hexadecimal (t) %6 05 hexadecimal (t) %7 06 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %4 Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %E Reserved %F ; (semicolon) %G < (less than)	%space	Select (t)
## State ## State	%-	Previous screen (t)
%1 00 hexadecimal (t) %2 01 hexadecimal (t) %3 02 hexadecimal (t) %4 03 hexadecimal (t) %5 04 hexadecimal (t) %6 05 hexadecimal (t) %7 06 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %A Reserved %B F11 (t) %C F12 (t) %D Reserved %F ; (semicolon) %G < (less than)	%.	Next screen (t)
%2 01 hexadecimal (t) %3 02 hexadecimal (t) %4 03 hexadecimal (t) %5 04 hexadecimal (t) %6 05 hexadecimal (t) %7 06 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %A Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%0	Enter (t)
%3 02 hexadecimal (t) %4 03 hexadecimal (t) %5 04 hexadecimal (t) %6 05 hexadecimal (t) %7 06 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %4 Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%1	00 hexadecimal (t)
%4 03 hexadecimal (t) %5 04 hexadecimal (t) %6 05 hexadecimal (t) %7 06 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %A Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%2	01 hexadecimal (t)
%5 04 hexadecimal (t) %6 05 hexadecimal (t) %7 06 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %A Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%3	02 hexadecimal (t)
%6 05 hexadecimal (t) %7 06 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %A Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %E Reserved %F ; (semicolon) %G < (less than)	%4	03 hexadecimal (t)
%7 06 hexadecimal (t) %8 07 hexadecimal (t) %9 08 hexadecimal (t) %A Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%5	04 hexadecimal (t)
%8 07 hexadecimal (t) %9 08 hexadecimal (t) %A Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%6	05 hexadecimal (t)
%9 08 hexadecimal (t) %A Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%7	06 hexadecimal (t)
%A Reserved %B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%8	07 hexadecimal (t)
%B F11 (t) %C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than)	%9	08 hexadecimal (t)
%C F12 (t) %D Reserved %E Reserved %F ; (semicolon) %G < (less than) %H = (equal) %I > (greater than) %J ? (question mark) %K [(left brace) %L \ (backslash) %M] (right brace) %N ^ (circumflex) %O _ (underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%A	Reserved
%D Reserved %E Reserved %F ; (semicolon) %G < (less than) %H = (equal) %I > (greater than) %J ? (question mark) %K [(left brace) %L \ (backslash) %M] (right brace) %N ^ (circumflex) %O _ (underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%B	F11 (t)
%E Reserved %F ; (semicolon) %G < (less than)	%C	F12 (t)
%F ; (semicolon) %G < (less than)	%D	Reserved
%G < (less than)	%E	Reserved
%H = (equal) %I > (greater than) %J ? (question mark) %K [(left brace) %L \ (backslash) %M] (right brace) %N ^ (circumflex) %O _ (underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%F	; (semicolon)
%I > (greater than) %J ? (question mark) %K [(left brace) %L \ (backslash) %M] (right brace) %N ^ (circumflex) %O _ (underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%G	< (less than)
%J ? (question mark) %K [(left brace) %L \ (backslash) %M] (right brace) %N ^ (circumflex) %O _ (underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%H	= (equal)
%K [(left brace) %L \ (backslash) %M] (right brace) %N ^ (circumflex) %O _ (underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%I	> (greater than)
<pre>%L</pre>	% J	? (question mark)
%M] (right brace) %N ^ (circumflex) %O _ (underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%K	[(left brace)
%N ^ (circumflex) %O(underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%L	\ (backslash)
%O _ (underscore) %P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved %Y Reserved	%M] (right brace)
%P { (left brace) %Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved %Y Reserved	%N	^ (circumflex)
%Q (vertical bar) %R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved %Y Reserved	%O	_ (underscore)
%R } (right brace) %S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%P	{ (left brace)
%S ~ (tilde) %T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	$% \mathbf{Q}$	(vertical bar)
%T Keyboard delete (t) %U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%R	} (right brace)
%U Reserved %V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%S	~ (tilde)
%V @ (at) %W ' (grave accent) %X Reserved %Y Reserved	%T	Keyboard delete (t)
%W '(grave accent) %X Reserved %Y Reserved	%U	Reserved
%X Reserved %Y Reserved	%V	@ (at)
%Y Reserved	%W	' (grave accent)
	%X	Reserved
%Z F13 (t)	%Y	Reserved
	$\%\mathbf{Z}$	F13 (t)

Bar Code Scanning APPENDIX A

Table A-1 (Continued)
Key Press Sequences for Encoded Code 39

Sequence	Key
+space	09 hexadecimal (t)
+-	0A hexadecimal (t)
+.	0B hexadecimal (t)
+0	0C hexadecimal (t)
+1	0D hexadecimal (t)
+2	0E hexadecimal (t)
+3	0F hexadecimal (t)
+4	10 hexadecimal (t)
+5	11 hexadecimal (t)
+6	12 hexadecimal (t)
+7	13 hexadecimal (t)
+8	14 hexadecimal (t)
+9	15 hexadecimal (t)
+A	a
+B	b
+C	c
+D	d
+E	e
+F	f
+G	g
+H	h
+I	i
+J	j
+K	k
+L	1
+M	m
+N	n
+O	0
+P	p
+Q	q
+R	r
+S	S
+T	t
+U	u
+V	v
+W	W
+X	X
+Y	y
+Z	Z

APPENDIX A Bar Code Scanning

Table A-1 (Continued)
Key Press Sequences for Encoded Code 39

space	Sequence	Key
/. 18 hexadecimal (t) /0 19 hexadecimal (t) /1 1A hexadecimal (t) /2 1B hexadecimal (t) /3 1C hexadecimal (t) /4 1D hexadecimal (t) /5 1E hexadecimal (t) /6 1F hexadecimal (t) /7 Reserved /8 Reserved /9 Reserved /9 Reserved /A !(exclamation mark) /B "(double quote) /C #(pound) /D \$(dollar) /E %(percent) /F & (ampersand) /G '(single quote) /H ((left parenthesis) /J *(asterisk) /K +(plus) /L ,(comma) /M -(hyphen) /N F14 (t) /O /(forward slash) /P F15 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /Y Reserved /X Reserved /X Reserved /X Reserved /Y Reserved	/space	16 hexadecimal (t)
19 hexadecimal (t) 1	/-	17 hexadecimal (t)
/1 1A hexadecimal (t) /2 1B hexadecimal (t) /3 1C hexadecimal (t) /4 1D hexadecimal (t) /5 1E hexadecimal (t) /6 1F hexadecimal (t) /7 Reserved /8 Reserved /9 Reserved /4 ! (exclamation mark) /B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G '(single quote) /H ((left parenthesis) /I) (right parenthesis) /I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /V Reserved <td>/.</td> <td>18 hexadecimal (t)</td>	/.	18 hexadecimal (t)
/2	/0	19 hexadecimal (t)
1	/1	1A hexadecimal (t)
/4 1D hexadecimal (t) /5 1E hexadecimal (t) /6 1F hexadecimal (t) /7 Reserved /8 Reserved /9 Reserved /9 Reserved /A ! (exclamation mark) /B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /V Reserved /X Reserved /Y Reserved	/2	1B hexadecimal (t)
/5 1E hexadecimal (t) /6 1F hexadecimal (t) /7 Reserved /8 Reserved /9 Reserved /4 ! (exclamation mark) /B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /V Reserved /X Reserved /Y Reserved	/3	1C hexadecimal (t)
/6 1F hexadecimal (t) /7 Reserved /8 Reserved /9 Reserved /A ! (exclamation mark) /B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	/4	1D hexadecimal (t)
/7 Reserved /8 Reserved /9 Reserved /A ! (exclamation mark) /B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /X Reserved /Y Reserved	/5	1E hexadecimal (t)
/8 Reserved /9 Reserved /A ! (exclamation mark) /B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	/6	1F hexadecimal (t)
/9 Reserved /A ! (exclamation mark) /B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	/7	Reserved
/A ! (exclamation mark) /B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /Y Reserved	/8	Reserved
/B " (double quote) /C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	/9	Reserved
/C # (pound) /D \$ (dollar) /E % (percent) /F & (ampersand) /G ' (single quote) /H ((left parenthesis) /I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	/A	! (exclamation mark)
/D \$ (dollar) /E % (percent) /F & (ampersand) /G '(single quote) /H ((left parenthesis) /I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /Y Reserved	/B	"(double quote)
/E % (percent) /F & (ampersand) /G '(single quote) /H ((left parenthesis) /I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	/C	# (pound)
/F & (ampersand) /G '(single quote) /H ((left parenthesis) /I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	/D	\$ (dollar)
/G '(single quote) /H ((left parenthesis) /I)(right parenthesis) /J *(asterisk) /K +(plus) /L ,(comma) /M -(hyphen) /N F14 (t) /O /(forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	$/\mathbf{E}$	% (percent)
/H ((left parenthesis) /I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /Y Reserved	$/\mathbf{F}$	& (ampersand)
/I) (right parenthesis) /J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /X Reserved /Y Reserved	/G	'(single quote)
/J * (asterisk) /K + (plus) /L , (comma) /M - (hyphen) /N F14 (t) /O /(forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/H	((left parenthesis)
/K	/I) (right parenthesis)
/L , (comma) /M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	$/\mathbf{J}$	* (asterisk)
/M - (hyphen) /N F14 (t) /O / (forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/K	+ (plus)
/N F14 (t) /O /(forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/L	, (comma)
/O /(forward slash) /P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/M	- (hyphen)
/P F15 (t) /Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/N	
/Q F16 (t) /R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/O	/ (forward slash)
/R F17 (t) /S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/P	F15 (t)
/S F18 (t) /T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/Q	F16 (t)
/T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/R	F17 (t)
/T F19 (t) /U F20 (t) /V Reserved /W Reserved /X Reserved /Y Reserved	/S	F18 (t)
/V Reserved /W Reserved /X Reserved /Y Reserved		
/V Reserved /W Reserved /X Reserved /Y Reserved	/U	F20 (t)
/W Reserved /X Reserved /Y Reserved		
/X Reserved /Y Reserved		
/Y Reserved		
	$/\mathbf{Z}$: (colon)

Bar Code Scanning APPENDIX A

Terminating Keys

Terminating keys are the nonprintable ASCII sequences and action keys. When the terminal encounters them in a bar code, an action is taken, and the terminal sends the data in the buffer to the host computer. Terminating keys should appear only at the end of the bar code. If they are located in the middle of a bar code, they are executed normally, but the data following them in the bar code is ignored. Terminating keys cause a terminal-to-base station transmission. The terminal ignores data in the bar code buffer following these keys once a transmission takes place.

For example, the terminal interprets this sequence:

123\$V456

as

123F6

The terminal will not send "456" to the host computer, because it follows terminating key F6.

ASCII sequences can be used any time before a terminating key. For example, the terminal interprets

+H+E+L+L+O\$M

as

hello<Enter>

Concatenation

When Encoded Code 39 is enabled, all bar codes are concatenated. This allows several separate bar code scans to be strung together into one input field. This feature is especially useful when using separate Encoded Code 39 bar codes to replace operator key presses.

For example, if the bar code "1234" is scanned followed by the scanning of a separate "\$C" bar code, the terminal keeps the "1234" in the starting field and tabs to the next unprotected field. If concatenation was not automatically enabled, the "1234" bar code would be cleared out due to the second scan. Then the terminal would tab to the next unprotected field.

Enabling Encoded Code 39 also allows scanning to occur when the cursor is in a protected field. This feature is provided to allow scanning of cursor movement functions (such as Forward Tab and Back Tab) while in a protected location on the screen. Scanning alphanumeric codes in a protected field causes an error tone for each character scanned.

APPENDIX A Bar Code Scanning

Escape Characters

The four escape characters in Table A-1 yield a VT220 data stream key press equivalent when followed by another character. The escape characters are:

- \$ (dollar sign)
- % (percent)
- + (plus)
- / (forward slash)

For example:

- ▶ If a bar code contains the sequence "%U" somewhere within it, the terminal converts this sequence to an [ENTER] key and processes it as soon as encountered in the scanning buffer.
- "+B" is converted to the lower case "b."
- "%B" is converted to an F11 key press.

If you want the Encoded Code 39 option but the bar codes to be scanned already contain the "\$," "%," "+," or "/," character, then each place where these characters occur must be expanded to a special "/" sequence:

- ▶ Every bar code where the "\$" is maintained must be expanded to a "/D" sequence.
- ▶ Percent signs (%) must be expanded to "/E".
- ► Forward slashes (/) must be expanded to the letter "/O".
- ▶ Plus signs (+) must be expanded to "/K".

Bar Code Scanning APPENDIX A

Appendix B Full ASCII Table

This table lists the ASCII characters and their binary, hexadecimal, and Code 39 equivalents.

\mathbf{Binary}_0	Hex^1	\mathbf{Dec}^2	C39 3	Char ⁴	\mathbf{Binary}_0	Decimal	\mathbf{Dec}^2	C39 3	Char ⁴
00000000	00	00	%U	NUL	00100000	20	32	SP	SP ⁵
0000001	01	01	\$A	SOH	00100001	21	33	/A	!
0000010	02	02	B	STX	00100010	22	34	/B	"
00000011	03	03	C	ETX	00100011	23	35	$/\mathbf{C}$	#
00000100	04	04	\$D	EOT	00100100	24	36	/D	e
00000100	05	05	φD \$Е	ENQ	00100100	$\frac{24}{25}$	37	/D /3	\$ %
00000101	06	06	ъв \$F	ACK	00100101	26	38	/ S / F	% &
00000110	07	07	ъг \$G	BEL	00100110	$\frac{26}{27}$	39	/ F /G	&
00000111	07	07	ąG	DEL	00100111	21	39	/G	
00001000	08	08	\$H	BS	00101000	28	40	/H	(
00001001	09	09	I	HT	00101001	29	41	/I)
90001010	0A	10	J	\mathbf{LF}	00101010	2A	42	J	*
00001011	0B	11	K	VT	00101011	2B	43	/K	+
00001100	0C	12	L	\mathbf{FF}	00101100	$2\mathrm{C}$	44	/L	
00001100	0D	13	\$М	$\overline{\mathrm{CR}}$	00101100	$^{2}\mathrm{D}$	45	/ M	,
00001101	0E	14	\$N	SO	00101101	2E	46	/N	_
00001110	0E	15	\$O	SI	00101110	2F	47	/O	,
00001111	OF	10	φΟ	51	00101111	21	41	/0	/
00010000	10	16	\$P	DLE	00110000	30	48	/P 6	0
00010001	11	17	Q	DC1	00110001	31	49	$/\mathbf{Q}$	1
00010010	12	18	R	DC2	00110010	32	50	$/\mathrm{R}$	2
00010011	13	19	\$S	DC3	00110011	33	51	/S	3
00010100	14	20	T	DC4	00110100	34	52	/ T	4
00010100	15	21	\$U	NAK	00110100	35	53	/ U	5
00010101	16	22	\$V	SYN	00110101	36	54	/V	6
00010110	17	23	\$W	ETB	00110111	37	55	/ W	7
00010111	1.	20	ΨΨ	LID	00110111	01	00	, , , ,	•
00011000	18	24	\$X	CAN	00111000	38	56	/X	8
00011001	19	25	\$Y	$\mathbf{E}\mathbf{M}$	00111001	39	57	/ Y	9
00011010	1A	26	Z	SUB	00111010	3A	58	$/\mathbf{Z}$:
00011011	1B	27	%A	ESC	00111011	3B	59	$\%\mathrm{F}$;
00011100	1C	28	%B	FS	00111100	3C	60	%G	<
00011100	1D	29	%C	GS	00111101	3D	61	%Н	=
00011101	1E	30	%D	RS	00111101	3E	62	%I	>
00011110	1F	31	%E	US	00111110	3F	63	%J	?
00011111	11	91	/013	OB	00111111	91	00	/00	•

APPENDIX B Full ASCII Table

\mathbf{Binary}_0	Hex ¹	Dec ²	C39 3	Char ⁴	\mathbf{Binary}_0	Decimal	Dec ²	C39 3	Char ⁴
01000000	40	64	%V	@	01100000	60	96	%W	6
01000001	41	65	A	A	01100001	61	97	+A	a
01000010	42	66	В	В	01100010	62	98	+B	b
01000011	43	67	\mathbf{C}	\mathbf{C}	01100011	63	99	+C	c
01000100	44	68	D	D	01100100	64	100	+D	d
01000101	45	69	\mathbf{E}	${f E}$	01100101	65	101	$+\mathbf{E}$	e
01000110	46	70	\mathbf{F}	\mathbf{F}	01100110	66	102	+F	\mathbf{f}
01000111	47	71	G	G	01100111	67	103	+G	g
01001000	48	72	H	H	01101000	68	104	+H	h
01001001	49	73	I	I	01101001	69	105	+I	i
01001010	4A	74	J	J	01101010	6A	106	+J	j
01001011	4B	75	K	K	01101011	6B	107	+K	k
01001100	40	E0	т	т	01101100	00	100	. T	1
01001100	4C	76	L	L	01101100	6C	108	+L	1
01001101	4D	77 70	M	M	01101101	6D	109	+M	m
01001110	4E	78 78	N	N	01101110	6E	110	+N	n
01001111	4F	79	O	O	01101111	6F	111	+O	0
01010000	50	80	P	P	01110000	70	112	+P	p
01010001	51	81	Q	Q	01110001	71	113	+Q	\mathbf{q}
01010010	52	82	Ŕ	R	01110010	72	114	+R	r
01010011	53	83	\mathbf{S}	\mathbf{S}	01110011	73	115	+S	\mathbf{s}
01010100	54	84	${f T}$	${f T}$	01110100	74	116	+T	\mathbf{t}
01010101	55	85	U	U	01110101	75	117	+U	u
01010110	56	86	V	V	01110110	76	118	+V	v
01010111	57	87	W	W	01110111	77	119	+W	w
0.4.0.4.0.0									
01011000	58	88	X	X	01111000	78	120	+X	X
01011001	59	89	Y	Y	01111001	79	121	+Y	У
01011010	5A	90	\mathbf{Z}	Z	01111010	7A	122	+Z	Z
01011011	5B	91	$\%\mathrm{K}$	[01111011	7B	123	%P	{
01011100	5C	92	%L	\	01111100	$7\mathrm{C}$	124	$\%\mathbf{Q}$	1
01011100	5D	93	%L	Ì	01111100	7C 7D	124 125	% ∀ %R	}
01011101	5E	93 94	%N	^ 1	01111101	7E	126	%K %S	, ~
01011110	5E 5F	94 95	%N %O		01111110	7E 7F	120 127	%S %T7	
01011111	16	90	% ∪	_	01111111	íΓ	141	70 1 /	n 8

Notes for the Full ASCII Table:

- Bit positions are 76543210.
- 1 Hexadecimal value
- 2 Decimal value
- 3 Code 39 character(s)
- ASCII character 4
- 5 SP is the SPACE character.
- 6 The Code 39 characters /P through /Y may be interchanged with the numbers 0 through 9.
- May be interchanged with %X or %Y or %Z.
- n is the DELETE character.

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